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C. B. ROBINSON, PH. D.; P. W. GRAFF, B. S.; W. H. BROWN, PH. D.

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THE PHILIPPINE
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VOL. VIII FEBRUARY, 1913 No. 1

THE RELATION OF THE SUBSTRATUM TO THE GROWTH OF ELODEA

By WILLIAM H. BROWN

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

INTRODUCTION

The slight development of conducting tissue in many water plants, together with the thinness of the epidermis, has led to a widespread belief that most submerged plants take nutrient salts largely if not entirely from the water in which the stems and leaves are floating, and that the roots serve only as organs of attachment. The conclusion that submerged plants absorb nutrient salts through the epidermis of the leaves and stems is, however, as pointed out by Pond,[1] based on *a priori* rather than experimental grounds.

Several observers have found that colored solutions will rise in the stems of certain submerged plants if the cut ends of the stems are placed in the solutions; see Pond.[2] Thoday and Sykes [3] report a rise of a solution of eosin in a stem of *Potamogeton lucens* at the rate of 9.5 cm a minute. Pond states that the amphibious plant *Ranunculus aquatilis* var. *trichophyllus* absorbs

[1] Pond, R. H. The Biological Relation of Aquatic Plants to the Substratum. Rept. U. S. Comm. Fish and Fisheries 29 (1905) 483–526.

[2] *L. c.*

[3] Thoday, D. & Sykes, M. G. Preliminary Observations on the Transpiration Current in Submerged Water-plants. *Ann. Bot.* 23 (1909) 635–637.

water through its roots and that in two experiments the roots absorbed lithium nitrate, which was then transported to the stem and leaves. The passage of water through a submerged plant, however, does not show that the roots are of any advantage in obtaining nutrient salts, for, in most cases, it is doubtful if the water, in which the stems and leaves are growing, contains a much smaller percentage of nutrient salts than does the water in the soil. Moreover, even though the solution in the soil were more concentrated, it seems hardly likely that the cells of the growing region and thin leaves would contain a much higher percentage of nutrient salts than would diffuse into them from the surrounding water, provided, of course, that the outer walls of the cells are permeable, and there is nothing to show that this is not the case in most submerged plants. If a concentrated solution did flow through the vessels of the stem and leaves, the salts in solution would tend to diffuse into the outside water before reaching the cells of the growing point and leaves where they would most likely be used.

The writer, in some experiments which will be described in a future paper, has observed a rise of a solution of eosin at the rate of 4.2 cm a minute in the vessels of a cut stem of *Elodea* exposed to sunlight. The direction in which the solution passed through the vessels was found to depend on the position of the stem. When the basal end was placed in the solution the latter passed from the basal towards the apical end. If the tip was removed and the end of the stem nearest the apex placed in the solution while the basal end was supported above it, the eosin then passed through the vessels in the reverse direction. Bubbles of gas also pass through the stem along with the solution. If the end which is uppermost is cut the gas escapes as a stream of bubbles from this end. When the tip is intact and above the basal end the gas escapes in the same manner from the axils of one or more leaves. The gas would seem to afford an explanation of the movement of the water, for, under the conditions described above, a vessel is a capillary tube containing a column of water and gas, and such a column will tend to rise in a capillary tube immersed in water. As the column rises more bubbles of gas would be formed below and so the flow would tend to be continuous. The formation of the bubbles of the gas, which is mostly oxygen, would probably produce pressure in the vessel and this would again tend to carry the column upwards as any downward movement would have to overcome the pres-

sure exerted by the weight of the water above the lower end. Barnes [4] suggests that the heating of the leaves may create the conditions necessary for the circulation of water in aquatics. It would appear that the three factors mentioned above are sufficient to explain the movements of the water in *Elodea* and that the movement is therefore a necessary consequence of the physical construction of the plant.

That water should ascend in a plant under such conditions certainly does not justify the conclusion that the movement is of advantage to the plant by causing a condensation of nutrient salts or that roots are of advantage as absorbing organs. It may be noted here that proof is lacking for the theory that transpiration causes a condensation of these salts in terrestrial plants.

Pond [5] grew a number of submerged plants including *Elodea canadensis,* rooted in good soil; anchored over the same soil; rooted in sand; and floating over sand. The plants rooted in soil grew very much better than those in any of the other three conditions. Pond states that the six plants studied by him, "are dependent upon their rooting in the soil for optimum growth, and can not survive a single season if denied a substratum of soil." This writer did not reach any definite conclusion as to the explanation of this fact but seemed to incline to the view that the greater growth of the rooted plants was connected with the absorption of nutrient material by the roots.

Brown [6] observed that the submerged aquatics of Lake Ellis were distributed according to the nature of the soil substratum, *Elodea canadensis* and *Sphagnum* occurring on muddy soil containing large quantities of organic matter, while *Myriophyllum* and *Eriocaulon compressum* grew on a coarse sandy soil. This writer suggested that the distribution of the plants might be due to different amounts of CO_2 given off by the two soils.

The experiments, reported in this paper were carried on in the green house of the Botanical Department of the Johns Hopkins University during the winter and spring of 1910. The writer wishes to express his thanks to Prof. B. E. Livingston for valuable suggestions and criticisms and for placing every possible convenience at his disposal.

[4] Barnes, C. R. *Bot. Gaz.* **49** (1910) 77.

[5] Rept. U. S. Comm. Fish and Fisheries **29** (1905) 483–526.

[6] Brown, W. H. The Plant Life of Ellis, Great, Little, and Long Lakes in North Carolina. *Contr. U. S. Nat. Herb.* **13** (1911) 323–341.

The object of the experiments was not to determine quantitatively the optimum conditions for the growth of *Elodea*, but to find out the manner in which a soil would most likely affect the growth and distribution of such a plant and if possible to determine the value of the rooted condition.

MATERIAL AND METHODS

The original stock of *Elodea* was obtained from Henry A. Dreer of Philadelphia under the name *Anacharis canadensis* var. *gigantea*. This plant is especially favorable for the study of growth as long unbranched stems, without roots, are easily obtained. All of the experiments were started with unbranched stems 10 cm in length.

Stock cultures were kept in battery jars with and without a layer of soil in the bottom and in others through which CO_2 was passed for from 5 to 10 minutes several times a day. The last method produced the best plants and so was used exclusively. The CO_2 was obtained from a generator and passed through a solution of $NaHCO_3$ to remove any trace of acid. Commercial CO_2, put up in tanks, was found to be very detrimental to the growth of the plants. This was probably due to the presence of some poisonous gas.

Since individual plants and stems of plants, of the same species, are known to vary in their rates of growth, it seemed advisable to determine this rate for all stems before using them in an experiment. This was done by taking a large number of stems, 10 cm long, unbranched and without roots, and placing them in jars, through which CO_2 was passed as in the stock cultures, care being taken that all of the plants received practically the same amount of light. At the end of three to five days the increase in length was measured and a selection made of those showing approximately the same rate of growth. The plants were then cut down to 10 cm in length and employed in an experiment. The length of all plants was measured from the cut end to the tips of the longest leaves around the growing point. A single average example will illustrate the value of this method. On the first of April 178 plants 10 cm in length and similar in appearance were selected and treated as just described. Four days later the increase in length was measured in mm. The results are given in Table I.

TABLE I.—*Growth of 178 plants of Elodea, April 1 to 5.*

Growth.	Number of plants.	Growth.	Number of plants.	Growth.	Number of plants.	Growth.	Number of plants.	Growth.	Number of plants.
Mm.		*Mm.*		*Mm.*		*Mm.*		*Mm.*	
3	1	10	15	16	9	22	1	28	1
5	1	11	16	17	7	23	2	32	1
6	5	12	19	18	3	24	2	38	1
7	13	13	18	19	3	25	2	39	1
8	12	14	19	20	2	26	1		
9	15	15	5	21	2	27	1		

An examination of Table I shows that the growth in length varied from 3 to 39 mm. Fifty plants which had grown from 7 to 10 mm were used in the experiments recorded in Table V, and 80 which had grown from 11 to 16 mm in those recorded in Tables IX to XI. In placing the plants in the experiments, those which had made the same amount of growth were distributed as nearly equally as possible in the various jars. Each jar should, therefore, contain plants showing different rates of growth; but, under the same conditions, these rates should vary much less than if no selection had been made. A comparison of table 1 with tables 5 and 7 to 11 shows that the extent of the individual variations was decreased greatly by the selection. The individual variations should, moreover, be approximately equal in all jars; and consequently not a serious source of error.

EFFECT OF CO_2, FROM THE SOIL, ON GROWTH

A comparison of the amount of CO_2 which water will absorb, under ordinary conditions, with that used in photosynthesis by submerged plants, such as *Elodea,* would seem to show that the latter process would be greatly retarded unless CO_2, from some source other than the air, is added to the water. One hundred cc of water at 20° will dissolve [7] 90.14 cc of CO_2 if exposed in an atmosphere of the same. The amount dissolved will decrease in proportion as the percentage concentration of CO_2 in the atmosphere decreases, so that, under ordinary conditions, water at 20° will always absorb from the air a smaller percentage of CO_2 than is contained in it. Air contains,[7] on an average, about

[7] Thorpe, T. E. Dictionary of Applied Chemistry (1898).

0.034 per cent of CO_2. The jars used in most of the experiments reported in this paper contained three liters of water, which, under ordinary conditions, would absorb from the air less than 1.02 cc of CO_2. The rapidity with which this amount might be used by the plants in the experiment was determined in the following manner. Ten plants, 10 cm in length, were placed in a three liter jar. The number and length of the plants was the same as that usually employed in the experiments, while the bulk was much less than would ordinarily occur in nature in the same amount of water. On a bright day, CO_2 from a generator was passed through the water in the jar for ten minutes. After allowing an interval of fifteen minutes for the plants to become adjusted, the rate of absorption of CO_2 by the plants was calculated by measuring the amount of oxygen given off from the cut ends of the stems. This was found to be 1 cc in two minutes for the ten plants. Since this figure does not take into account all of the oxygen given off by the leaves and was probably not a maximum rate, it would seem that the plants could easily use up 1 cc of CO_2 in two minutes in the process of photosynthesis. This would mean that all of the CO_2 which the water would absorb from the air could be used by the plants in two minutes; and that, if the air were the only source of CO_2, the process of photosynthesis would be retarded unless the amount of CO_2, necessary to establish an equilibrium between the air and water, were to diffuse into the water every two minutes. This would, of course, be a much more rapid rate than could possibly occur.

Since the bulk of the plants, in the experiment just discussed, was much less than would ordinarily occur in nature in the same amount of water, it would seem that the process of photosynthesis, and probably also growth, would be accelerated if CO_2 were added to the water from some other source besides the air. In nature such CO_2 might come from animals living in the water and from the decomposition of organic matter in the soil. If water, which did not contain living organisms, was standing over soil, which gave off CO_2 in any considerable quantity, the layer of water in contact with the soil would take up some or all of this CO_2 and would contain a higher percentage of it than water into which CO_2 diffused only from the air. The CO_2 would then diffuse from this lower layer to the upper ones where it would tend to diffuse into the air until the water contained a smaller

percentage than the air. The result would be that the water, near the soil, would always contain more CO_2 than that near the surface. In view of this it would seem that submerged plants might grow better anchored near the soil than floating near the surface, and that roots, by keeping the plants near the soil, might, in some cases, be an advantage to them.

On the 14th of December, while carrying on experiments to determine the best way of keeping stock cultures, a large number of plants, which were for the most part without roots, were put in various kinds of jars, with and without a layer of soil in the bottom. At the end of three weeks it was found that all of the plants, in the jars without soil, were dead, while those in the jars with soil had made a good growth. There appeared, moreover, to be few if any more roots on the plants in the jars without soil than when the plants were first placed in them; while there was a vigorous growth of roots in the jars with soil. If the presence or absence of the rooted condition was the primary cause of the difference in the growth of the plants in the two cases, roots should have been formed in both, for they had to be produced in the second before the plants could become rooted. If would seem from this that the growth of the plants in the second case and the death in the first was not connected, primarily, with the presence or absence of the rooted condition; but rather that the production of roots was an expression of the more vigorous condition of the plants. It would seem, moreover, that this vigorous condition must have been due to some change produced by the soil, in the water in which the stems of the plants were growing.

To test this point more accurately a series of three-liter battery jars was prepared on the fifth of January. The first contained only tap water. The second was filled with tap water to which was added a bag of cheese cloth containing about 200 cc of good soil; the idea being that the water would be a saturated solution of this soil, while the plants would not have a chance to become rooted. The bottom of the third jar was covered with a layer of the same soil as that used in the second. At the end of three days the plants in the jar with only tap water had made an average growth of 3 mm, but after this there was no further growth and in less than twenty days all of the plants were dead. During the twenty days of the experiment no roots were produced by the plants in either the jar with only tap water or the one with the bag of soil. At the end of ten days, when roots were just beginning to appear on the plants in the

jar, the bottom of which was covered with a layer of soil, the plants in this jar had made an average growth of 2.3 cm, while those in the jar with the bag of soil had grown only 1.2 cm. At the end of twenty days those in the jar, with a layer of soil in the bottom, had made an average growth of 5.2 cm, were well rooted and had a vigorous appearance. At the same time two of the plants in the jar with the bag of soil were dead while the other eight were in an unhealthy condition and had grown, on the average, only 2.1 cm. The differences between the plants in the three jars could not have been caused by the roots because these differences were apparent before any of them were formed. This confirms the conclusions drawn from the preliminary experiments. The results must have been due to some change produced in the water, by the soil. It did not seem probable that the differences in the plants in the jars, with soil, could have been connected with the amount of salts in solution, for the water in the jar, with a bag of soil, was probably saturated for that soil. Later experiments will show that tap water contains a sufficient quantity of salts to keep ten plants alive for twenty days, and for them to make a much greater growth than any of the plants in this series. Differences in the amount of CO_2 present seemed to be more probable explanation. The soil used contained considerable organic matter and gave off CO_2. The layer of soil, in the bottom of the jar, afforded a larger surface for the entrance of O and the giving off of CO_2 and besides contained more soil than the bag in the other jar. The jar with tap water and no soil received only the amount of CO_2 which diffused from the air into the water.

To test the effect of adding CO_2 to water in which the stems were growing, the eight plants, in the jar with the bag of soil, which were still alive on the twenty-fifth of January were distributed two in each of four jars. Two of the jars contained only tap water, while the bottoms of the other two were covered with a layer of soil from which all organic matter had been removed by burning. CO_2, from a generator, was then passed through the water of one jar containing only tap water and one with the layer of soil. This was done by running a glass tube to the bottom of the jar and allowing the gas to pass through the tube.

At the end of ten days the plants, in the jars to which CO_2 had not been added, were dead; while the others had, despite their unhealthy condition, made a more vigorous growth than in the previous experiment. Measurements of the growth of the plants are given in Table II.

TABLE II.—*Growth of Elodea with and without addition of CO_2.*

No. of experiment.	Growth in cm with addition of CO_2.		Growth in cm without addition of CO_2.	
	Tap water.	Tap water and soil.	Tap water.	Tap water and soil.
1	1.8	1.7	Dead.	Dead.
2	1.6	1.5	Dead.	Dead.
Total	3.4	3.2		

The results show little difference between the plants in the jars with and without soil, but the beneficial effect of the addition of CO_2 is very evident.

In order to test, more accurately, the effect of the addition of CO_2, two series of three-liter jars were prepared on February sixth. One jar in each series contained tap water diluted with an equal volume of distilled water; another only tap water; while the bottom of the third was covered with a layer of burnt soil and the jar filled with tap water. Ten plants, 10 cm in length and without roots, were then placed in each jar. CO_2, from a generator, was passed through the water in the jars of one series for from five to ten minutes several times each day. The water was not changed during the experiment. The average growth of the ten plants in each jar, for periods of three and ten days, is given in Table III.

TABLE III.—*Growth of Elodea with and without addition of CO_2.*

(All figures are averages for 10 plants.)

Time.	Tap water diluted 100 per cent.	Tap water.	Tap water and soil.
	With addition of CO_2—		
Days.	*Cm.*	*Cm.*	*Cm.*
3	0.9	1.0	0.8
10	3.2	3.3	2.8
	Without addition of CO_2—		
3	0.3	0.3	0.25
10	0.3	0.3	0.25

These results show comparatively little difference between the plants in either series but a decided advantage in favor of those in the jars to which CO_2 had been added. At the end of the third day these had made about three times as much growth as

those in the other jars. By this time the plants in the jars, through which CO_2 had not been passed, had ceased growing, while the others were still making a good healthy growth. This would seem to show that under the conditions of this experiment the amount of CO_2 which diffused into the water from the air was not sufficient for the growth of the plants. Since the stock cultures were kept in jars through which CO_2 was passed, and all of the plants were making a healthy growth at the time that the experiment was started, it would also seem that a deficiency of CO_2 affects the growth of the plants very quickly.

On February eighteenth, two series were prepared which were similar to the last except that a jar, the bottom of which was covered with a layer of good soil, was added to each series. As in the last experiment ten plants, 10 cm long and without roots were placed in each jar. CO_2, from a generator, was then passed through the water in the jars of one series for from five to ten minutes several times each day. The average growth of the plants in each jar, for periods of three and ten days, is given in Table IV.

TABLE IV.—*Growth of Elodea with and without addition of CO_2 to water.*

(All figures are averages for 10 plants.)

Time.	Tap water diluted 100 per cent.	Tap water.	Tap water and burnt soil.	Tap water and soil containing organic matter.
	Growth with addition of CO_2—			
Days.	*Cm.*	*Cm.*	*Cm.*	*Cm.*
3	1.0	1.1	0.9	1.3
10	3.2	3.5	3.0	4.2
	Growth without addition of CO_2.			
3	0.3	0.35	0.25	0.5
10	0.3	0.35	0.25	1.6

At the end of three days the plants in all of the jars to which CO_2 had not been added, except those in the one with a layer of good soil, had ceased growing; while at the same time the plants in the corresponding jars, through which it had been passed, had made about three times as much growth as these, and continued to grow vigorously during the course of the experiment. These results are similar to those obtained in the last experiment. The greatest growth was made by the plants in the jar, the bot-

tom of which was covered with a layer of good soil and through which CO_2 was passed. The plants in the corresponding jar, to which CO_2 had not been added, had made a healthy growth; but this was much less than in any of those through which it had been passed. The greater growth made by the plants, in the jars containing the good soil, was probably due to the CO_2 given off by the soil. In the case of the jar, to which CO_2 had been added, the soil furnished a constant supply in addition to the intermittent one from the generator, and thus probably gave the plants in this jar an advantage over those which obtained CO_2 only from the generator and air.

Judging from the previous experiments, it is probable that had this and the last been run long enough death would have ensued in less than twenty days in the case of all of the plants which were dependent for their supply of CO_2 on that which diffused from the air into the water. All of the experiments, therefore, agree in showing that at Baltimore, during the winter months, and under the conditions of this experiment, sufficient CO_2, to keep the plants growing or even alive, does not diffuse from the air, into the water; and that unless CO_2 is added from some other source, growth stops in less than three days and death ensues in less than twenty. *Elodea* is therefore very sensitive to a diminution in the supply of CO_2. These results are what would be expected after a consideration of the amount of CO_2 which water absorbs from the air, and would seem to show that the quantity of CO_2 given off by different soils would markedly affect the growth of submerged plants rooted in them.

EFFECT OF VARIATIONS IN AMOUNT OF NUTRIENT SALTS

An examination of Tables III and IV shows very little difference between the growth of *Elodea* in tap water and in tap water diluted with an equal volume of distilled water. This would indicate that wide variations in the concentration of the salts in the water had little effect on the growth of *Elodea*. It seemed advisable, therefore, to try the effect of additions of nutrient salts to tap water. This was done by making up various strengths of Knop's solution with tap water. The basis of the additions was a Knop's solution made by taking 1.5 cc N. $CaNO_3$, 0.4 cc N. KNO_3, 0.4 cc N. $MgSO_4$, 0.4 cc K_2HPO_4, and adding sufficient tap water to make a liter. This solution was used in one half strength, full strength, two and four times full strength. In tables 5 to 7 these strengths are designated as 0.5, 1, 2, and 4 standard.

On the fifth of April a series of four 3-liter jars were filled with the different strengths and another jar with tap water. Ten plants, 10 cm long and without roots, were placed in each jar and CO_2 passed through the jars as previously described. The solutions were changed every five days. The experiment had to be abandoned at the end of fifteen days as after this vigorous growths of algae appeared in some of the jars. The growth of the individual plants for fifteen days is given in Table V.

TABLE V.—*Growth of Elodea in tap water and Knop's solution, April 5 to 20.*

No. of plant.	Growth in—				
	Tap water.	0.5 standard.	1 standard.	2 standard.	4 standard.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1	9.2	9.5	12.3	12.2	12.1
2	9.4	13.2	13.2	12.0	14.2
3	8.8	11.0	10.2	13.7	9.1
4	8.8	11.2	12.7	15.4	11.9
5	7.0	11.6	10.5	12.4	11.8
6	7.8	11.7	12.5	9.9	11.5
7	7.4	8.3	12.7	14.9	13.6
8	9.4	12.6	13.0	10.5	11.6
9	9.7	10.4	7.8	9.1	13.4
10	6.7	11.9	9.1	11.8	10.9
Total	83.7	111.4	114.0	121.9	120.1
Average	8.3	11.1	11.4	12.2	12.0

The greatest growth shown in Table V was made by the plants in twice the full strength of the standard solution. This growth was 48.2 per cent greater than that shown by the plants in tap water, but only 9.9 per cent greater than the smallest average growth made by any of the plants in the jars of Knop's solution. The difference between the plants in tap water and those in Knop's solution were considerable, but small when compared with those produced by variations in the amount of CO_2 in the water. The slight differences between the plants in the various jars of Knop's solution as compared with the greater differences between all of these plants and those in tap water would suggest that the Knop's solution added one or more elements in which the tap water was deficient but that wide variations in the concentration of Knop's solution produced only slight changes. This is in harmony with the similarity of the plants in previous experiments in tap water and in tap water diluted with an equal volume of distilled water.

In Table VI are given the results of an experiment similar to the last except that only two strengths of Knop's solution were used and the experiment run twenty-five days. There is a close similarity between the results of the two experiments.

TABLE VI.—*Growth of Elodea in tap water and Knop's solution, April 5 to 20.*

No. of plant.	Growth in—		
	Tap water.	0.5 standard.	1 standard.
	Cm.	*Cm.*	*Cm.*
1	10.7	11.3	17.9
2	11.1	17.9	18.6
3	11.7	26.4	11.2
4	11.2	18.6	17.2
5	14.6	10.2	17.0
6	10.6	14.6	15.3
7	13.9	16.4	22.2
8	11.8	15.5	18.3
9	14.2	21.2	18.3
10	11.1	17.7	23.9
Total	120.9	169.8	179.9
Average	12.1	17.0	18.0

On the tenth of April an experiment was started with a series of six three-liter jars containing respectively tap water and five strengths of Knop's solution. The basis of the Knop's solution was the same as in the last two experiments. Five plants 10 cm long and without roots were put in each jar, and no CO_2 passed through any of them. The growth of the individual plants for twenty-five days is given in Table VII.

TABLE VII.—*Growth of Elodea in tap water and Knop's solution without addition of CO_2.*

No. of plant.	Growth in—					
	Tap water.	0.5 standard.	1 standard.	2 standard.	4 standard.	5 standard.
		Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*
1	1.8	2.4	2.4	2.4	4.2	5.6
2	1.2	3.1	5.6	3.6	2.8	4.8
3	2.1	2.6	3.9	4.8	5.1	4.6
4	0.9	2.8	3.1	5.2	6.6	3.3
5	1.7	2.8	3.3	3.7	5.8	6.0
Total	7.7	13.7	18.3	19.7	24.5	24.3
Average	1.5	2.5	3.6	3.9	4.9	4.8

The growth shown in Table VII was very spindling and moreover did not keep pace with the death of the plants at the cut ends, so that they were all actually shorter at the end than at the beginning of the experiment. It was due only to the difference in the appearance of the growth before and after the plants were placed in the jars that the amount of growth could be measured. The dying at the cut end did not occur in any of the plants in the jars through which CO_2 was passed. The growth of the plants in this experiment, run during April and May, was much greater than that made during January and February by any of the plants in jars in which CO_2 was obtained only from the air. The plants in this experiment were alive at the end of twenty-four days whereas in the previous experiments growth ceased in less than three days and death ensued in less than twenty. This increased growth was observed in all experiments run without the addition of CO_2 during April and May and was probably connected with the greater intensity of the sunlight. However, in all cases, the plants were dying at a faster rate than they were growing so that, if kept under the same conditions, they would probably have died in a comparatively short time.

The results given in Table VII show that the addition of nutrient salts increased the growth of the plants when CO_2 was not passed through the water, the plants in the jar containing four times the standard strength of Knop's solution growing 215.7 per cent as much as those in tap water. This difference is, however, small when compared with that produced by passing CO_2 through the water. A comparison of Tables VI and VII shows that the growth of the plants, in tap water through which CO_2 was passed, was in twenty-five days 766.7 per cent as much as the growth of similar plants for twenty-four days in water to which CO_2 was not added. This, moreover, does not take into account the unhealthy condition of the latter plants.

The water used in these experiments came from a small stream near Baltimore and may be considered as an average soft water under natural conditions. Using it as a basis the experiments so far reported would seem to show that the addition of nutrient salts is nothing like so important for the growth of *Elodea* as the addition of CO_2 other than that absorbed from the air. The comparatively small variations produced by keeping the plants in solutions containing very different concentrations of nutrient salts would indicate, moreover, that under natural conditions

growth would be retarded more frequently by a scarcity of CO_2 than by a deficiency of nutrient salts.

VALUE OF ROOTED CONDITION

The different rates of growth, shown by the plants in the solutions of nutrient salt of various strengths, were all apparent before roots were formed on any of the plants. It is evident, therefore, that different concentrations of nutrient salts as well as of CO_2 may affect growth independently of the roots. It remains to be seen, however, whether the rooted condition is of value to the plant.

An attempt to test this point was made in the following manner. Three ten-liter battery jars were filled with tap water and the bottom of each covered with a layer of good soil containing organic matter. Ten plants 10 cm in length were then placed in each jar. Those in the first were held against the soil by small glass rods and soon became rooted. The plants in the other jars were left floating near the surface of the water. The roots of the plants in the second jar were allowed to grow down into the water while those of the plants in the third were removed as soon as formed. The stubs left on the plants collapsed very quickly so that it is not likely that they served as absorbing organs. The cut ends of all the plants were plugged with parafine. No CO_2 was passed through the water in any of the jars.

Very early in the experiment a flourishing growth of algae covered the soil in the jars containing the floating plants. At the same time the jar containing the rooted plants appeared to be free from algae. Several attempts were made to grow algae in this jar by transferring to it rather large quantities from the jars with floating plants. In every case the algae failed to make any appreciable growth and soon disappeared. The most reasonable explanation of this seemed to be that the CO_2 from the soil could be used by the algae when the plants of *Elodea* were floating near the surface while it would be largely taken from the water, by the latter, when they were anchored to the soil. The fact that these algae did not do well in ordinary tap water, except when CO_2 was passed through it, is in harmony with this conclusion; see Brown.[8] From what has been said it would seem that the rooted plants of *Elodea* should receive more CO_2 and make a better growth than the floating ones even though the roots were of no advantage in absorbing nutrient salts.

[8] *Contr. U. S. Nat. Herb.* **13** (1911) 323–341.

The growth of the plants in this experiment for a period of thirty days from the fifth of January to the fourth of February is given in Table VIII.

TABLE VIII.—*Growth of Elodea in jars with soil. 30 days.*

No. of plant.	Growth—		
	Rooted in soil.	Floating over soil. With roots.	Floating over soil. Without roots.
	Cm.	*Cm.*	*Cm.*
1	10.6	5.9	5.4
2	7.3	7.4	7.8
3	7.1	7.1	5.0
4	7.5	7.8	6.9
5	8.0	5.7	6.2
6	10.6	6.1	6.8
7	8.2	7.1	6.4
8	8.3	6.2	6.1
9	6.4	7.4	7.2
10	7.1	5.8	5.6
Total	81.1	66.0	63.4
Average	8.1	6.6	6.3

An examination of Table VIII shows that there was little difference between the growth of the floating plants with and without roots. This would seem to indicate that roots are of no advantage to *Elodea* if they are growing in the same solution in which the plants are floating.

The growth of the rooted plants was considerably greater than that of the floating ones. This could be explained readily on the ground already mentioned, and so these plants afford no evidence as to whether or not the roots are of advantage to *Elodea* as absorbing organs.

In order to test the value of roots as absorbing organs it seemed necessary to find a soil which contained nutrient salts but little or no organic matter. These requirements seemed to be met by a soil found at the base of a granite cliff and formed by the disintegration of the granite. Much of this soil had been weathered to the consistency of clay. For comparison with this soil clean washed quartz sand of a high degree of purity was also used as a substratum.

On the 5th of April a series of four three-liter jars was prepared. A layer of soil 4 cm deep was placed over the bottoms of two and a similar layer of sand in the other two. Ten plants 10 cm in length were then put in each jar. The plants in one jar containing soil and in one containing sand were held

against the substratum by small glass rods so that the plants could become rooted. In the other jars they were allowed to float at the surface. CO_2 from a generator was passed through the water in all of the jars for from ten to fifteen minutes several times each day. At the same time another series was prepared which was similar to this except that no CO_2 was passed through the water. The growth of the plants for a period of twenty days in the series in which CO_2 was added to the water is given in Table IX, and the growth of the plants in the other series for the same period in Table X. These two tables are summarized in Table XI.

TABLE IX.—*Growth of Elodea in water to which CO_2 was added.*

No. of plant.	Growth—			
	Rooted in soil.	Rooted in sand.	Floating over soil.	Floating over sand.
	Cm.	*Cm.*	*Cm.*	*Cm.*
1	15.5	12.8	13.4	11.1
2	11.2	14.8	13.0	15.4
3	13.7	12.7	16.4	19.6
4	13.1	12.6	13.5	12.1
5	13.1	15.8	13.9	15.1
6	13.1	14.2	13.8	13.9
7	12.3	17.6	12.6	15.1
8	12.2	17.4	13.4	14.0
9	16.3	13.0	14.8	9.9
10	11.5	9.7	13.5	16.9
Total	132.0	140.6	138.3	143.1
Average	13.2	14.1	13.8	14.3

TABLE X.—*Growth of Elodea in water to which CO_2 was not added.*

No. of plant.	Growth—			
	Rooted in soil.	Rooted in sand.	Floating over soil.	Floating over sand.
	Cm.	*Cm.*	*Cm.*	*Cm.*
1	1.8	5.5	5.3	4.3
2	3.4	0.5	3.1	6.9
3	4.0	3.1	6.5	5.5
4	2.5	2.5	7.3	6.7
5	1.7	3.7	5.9	9.3
6	3.8	2.1	8.2	8.5
7	2.9	3.7	4.0	3.2
8	4.8	4.5	6.1	0.4
9	3.6	3.0	2.7	5.3
10	2.8	2.6	6.1	5.4
Total	31.3	31.2	50.7	55.5
Average	3.13	3.12	5.07	5.55

TABLE XI.—*Summary of Tables 9 and 10.*

Position of plant during growth.	Average growth, in cm, of plants in water through which—	
	CO_2 was passed.	CO_2 was not passed.
	Cm.	*Cm.*
Rooted in soil	13.2	3.1
Anchored over soil	13.8	5.1
Rooted in sand	14.0	3.1
Anchored over sand	14.3	5.1

An examination of Table IX shows that there was very little difference between the plants in any of the jars through which CO_2 was passed. The floating plants averaged a little greater growth than the rooted ones, but the difference may well be within the limits of experimental error. It is to be noted that the roots of the rooted plants developed an abundant growth of root hairs while these were entirely absent in the case of the floating plants. The surface of the root system of the rooted plants was therefore many times greater than that of the floating ones. Since, however, the floating plants grew slightly better than the rooted ones it would seem that under the conditions of this experiment the rooted condition was of no advantage to the plants, while this experiment, together with those previously described, would appear to show that the function of absorption can be performed by the leaves or stems independently of the roots.

Very few roots were developed on the plants in the jars through which CO_2 was not passed. The results given in Table X show that in these jars there was very little difference between the plants over the substratums of sand and soil. The floating plants, however, showed a considerably greater growth than did those held against the substratum. This may readily be explained as due to the floating plants being nearer to the air which was the only source of CO_2.

Table XI shows that while there was very little difference between the rate of growth of the plants in any of the jars through which CO_2 was passed that all of these plants made a very much greater growth than any of those in the jars through which CO_2 was not passed. The growth of the latter plants was, moreover, very spindling, and the increase in length was not as rapid as the death at the cut ends. These plants were, therefore, actually shorter at the end than at the beginning

of the experiment; while the plants in the jars through which CO_2 was passed showed no signs of dying at the cut ends. This again emphasizes the important influence which variations in the percentage of CO_2 exert on the growth of this plant.

Results essentially similar to those given in Tables VIII to XI were obtained in another series of experiments which were practically identical with those just described. The details are omitted as they show nothing new.

Pond [9] found that several species of submerged aquatics grew much better when rooted in a good soil than when anchored over the same soil and concluded that they could not survive a single season, if denied a substratum of soil. These results are in harmony with those given in Table VIII. The explanation would seem to be that the roots act as anchoring organs holding the plants near the soil which serves as a source of CO_2 rather than that they are necessary for the absorption of nutrient salts, the rooted condition proving of no advantage to the plants when the substratum did not give off CO_2. It is of course possible that roots may be of advantage as absorbing organs under other conditions than those tried in these experiments or for other submerged aquatics, but it would seem probable that their chief function, in the case of plants similar to *Elodea*, is that of anchorage. The rooting of the plants of *Elodea* certainly does not seem to be essential for their healthy growth when they are furnished with an abundant supply of CO_2.

Kofoid [10] after making careful quantitative determinations of the plankton in a number of lakes concluded that "the amount of plankton produced by bodies of fresh water is, other things being equal, in some inverse ratio proportional to the amount of its gross aquatic vegetation of the submerged sort." He attributes the scarcity of plankton in lakes containing submerged vegetation to a number of causes, but chiefly to the removal from the water, by the larger aquatics, of a great part of the available food material.

In a discussion of Pond's experiments by Reighard and Pond [9] these authors concluded that, if Pond's observations are correct, submerged aquatics when rooted not only act as a mechanical support for algae, but also play an important nutritive rôle by

[9] Rept. U. S. Comm. Fish and Fisheries **29** (1905) 483–526.

[10] Kofoid, C. A. The Plankton of the Illinois River, 1894–1899, with Introductory Notes on the Hydrography of the Illinois River and its Basin. Part I. Quantitative investigations and results. *Bull. Illinois State Laboratory of Natural History* **6** (1903) 95–629.

taking nutrient salts from the soil and organizing them into vegetable matter. "Upon the decay of the vegetable matter this food material is believed to pass into solution in the water. It should there nourish the plankton algae." Reighard and Pond ascribe Kofoid's results to the fact that the vegetation with which he was dealing was largely *Ceratophyllum*, and therefore not rooted.

The experiments with *Elodea* would seem to show that such a plant would compete with the plankton algae for both CO_2 and nutrient salts and would therefore be very detrimental to their growth. This is in agreement with the results obtained from experiments with algae; see Brown [11]; and with the conclusions reached by Kofoid.

SUMMARY

Sufficient CO_2 to keep *Elodea* growing or even alive does not diffuse from the air into the water at Baltimore during the winter and spring months.

The substratum may serve as an important source of CO_2.

Elodea is not dependent on its roots for the absorption of nutrient salts.

A solution of eosin may rise in the vessels of a cut stem of *Elodea* at the rate of 4.2 cm a minute. This appears to be due to certain physical factors and does not show that the roots are of advantage as absorbing organs.

The chief function of the roots seems to be that they anchor the plants to the substratum, which may be of great advantage to the plants when the soil contains organic matter and gives off CO_2. This appears to explain the fact that plants rooted in a good soil grow better than those anchored over the same substratum.

When CO_2 was not given off by the soil used in the experiments but was supplied from a generator the rooted and floating plants grew about equally well. When similar soils were used and no CO_2 supplied from a generator the floating plants grew better than the rooted ones. In this case the air was the chief source of CO_2.

It would seem that under natural conditions variations in the amount of CO_2 in the water are more likely to affect the growth of *Elodea* than variations in the percentage of nutrient salts in solution.

[11] *Contr. U. S. Nat. Herb.* 13 (1911) 323–341.

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FACTORS INFLUENCING FUNGUS SUCCESSION ON DUNG CULTURES

By WILLIAM H. BROWN AND PAUL W. GRAFF

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

The phenomenon of succession, or the gradual replacement of one association of plants by another, is of widespread occurrence and probably effects the distribution of almost all kinds of plants. Owing, perhaps, to the greater prominence of the vascular plants, the phenomenon has been studied chiefly in connection with these; but it is by no means confined to them. It is a well-known fact that a number of fungi occur in a rather definite succession on horse dung when placed in a moist chamber. The first to appear usually belong to genera of the *Mucoraceae.* These die down and are followed by a variety of forms which vary with the conditions. In Manila this stage is usually represented by the genera *Oospora, Botrytis, Sordaria,* and others in less quantity. After this several species of *Coprinus* usually appear and may continue to produce fruit bodies for a considerable period. The succession is frequently much more complicated than that outlined above.

Successions of flowering plants are frequently due to geologic factors such as the weathering or erosion of the soil. In other cases, the primary causes of a succession consist of changes in purely physical factors produced by its first members. Examples are the increasing of the water-holding capacity of soils by the accumulation of vegetable matter and the binding of wind-blown sand. It would seem evident that neither of the above classes of factors could be operative in the case of the succession here considered.

There are, however, a number of theories which are frequently advanced in explanation of the succession of vascular plants; and which, on theoretical grounds, might be considered as possibly applicable to successions such as the one described above. Some of the most prominent of these may be mentioned. The death of the first plants of a succession is frequently caused by the competition of those representing a later stage. In this case the

success of the latter plants may be due to the fact that the first have altered the soil in such a manner that it will support them. Many writers have advocated the view that when one plant grows on a soil for a considerable length of time it removes certain nutritive substances to such an extent that it is no longer able to make a vigorous growth. Others have held that plants excrete substances which are toxic to the species which excretes them, but may not produce harmful effects in other plants. These last two hypotheses have naturally frequently been used to explain the same phenomena. Another factor which might affect successions of either vascular plants or fungi is the growth of microörganisms in the soil. In the case of the succession under consideration it is also necessary to consider the possible effect of the drying out of the substratum. The object of the present paper is to decide which, if any, of the above hypotheses will furnish a solution of the cause of the succession of fungi on dung cultures.

The work here reported was carried on at the Bureau of Science, Manila from January to June, 1912.

EXPERIMENTATION

On the 29th of January a collection of horse dung was made from the streets of Manila. Twenty cakes were placed in the sun and left until their outer surfaces became slightly dry, after which they were distributed, five in each of four covered glass dishes. By the next day there were signs of two mucors which later proved to be *Mucor racemosa* Fres., and *Absidia caerulea* Bain. On the second day there was a fair growth of both molds and slight signs of *Oospora* sp. By the third day the two mucors had made their maximum growth which, however, was not very vigorous. The *Oospora* continued to increase in abundance for several days longer. On the fourth of February, at the end of six days, *Coprinus stercorianus* Fr. and *C. plicatilis* Fr. appeared in the cultures. By this time the growth of the mucors had decreased markedly and they died out three days later. The *Oospora* disappeared a few days after the molds, while the fruit bodies of the two species of *Coprinus* continued to be produced for two months, which was as long as the cultures were kept. During the latter part of this period other fungi appeared in the cultures but in minor quantities.

Twelve other cultures were run with dung obtained from the stable of the Bureau of Science. The results in all cases were essentially similar to those just described. In some of the dishes only one of the mucors appeared, while in one, the two were

accompanied by a species of *Pilobolus.* In a few cases species of *Botrytis* and *Sordaria* appeared along with *Oospora,* while other species of *Coprinus* sometimes took the place of those previously mentioned. The succession described in detail thus appears to be characteristic of what may be expected to occur in Manila and was therefore made the basis of further work.

Pure cultures of each of the five fungi were kept growing on agar, the fungi being transferred to fresh tubes as often as was necessary to keep them in good condition. All inoculations made in the experiments were from these pure cultures. The dung used was obtained from the stable of the Bureau of Science and so should have been substantially similar in all cases.

Since the mucors were the first of the fungi both to appear and disappear the experiments were directed largely toward discovering the cause of their early death. The first question considered was the possibility of this having been due to toxins which the plants themselves might have excreted. In order to test this six cakes of dung were placed in each of four covered glass dishes. The dishes and dung were then sterilized to kill all organisms contained in them. This was accomplished by heating in an autoclave for fifteen minutes at 120° under a pressure of one kilo. On the 7th of February two dishes were inoculated with *Mucor racemosa* and two with *Absidia caerulea.* On the third day after inoculation the growth of the mucor was in every case much greater in all dishes than that which had occurred in any of the unsterilized cultures and continued to be healthy for eight weeks. After this the substratum dried out and they gradually ceased growing but appeared to be alive at the end of another month. Twelve other sterile cultures were run at various times in Erlenmeyer flasks the bottoms of which were covered with a layer of dung 2 cm deep. These gave results very similar to those just described. It is to be noted that the mucors on the sterile dung were still alive even after the substratum had apparently become air dried while those on unsterilized dung always disappeared completely in less than ten days. This, together with the much more vigorous appearance of the former, would seem to show that the death of the molds in the original cultures could hardly have been due to toxins which they excreted. It would also appear that these facts exclude the idea that the mucors could have used all of the food material which was suitable for them.

The results in the original cultures could moreover not have been due to differences in the amount of water in the substratum.

It was noted that fresh dung which had not been allowed to dry out to some extent, before being placed in covered dishes, never produced any mucors even when inoculated with the spores or hyphae. Moreover, when unsterilized dung, even after being slightly dried, was mashed, mixed, and placed in an Erlenmeyer flask the growth of molds which appeared on it was always very scanty. This also appeared to be due to an excess of moisture, for a slight drying does not greatly affect more than the superficial layers and the mixing of the mashed dung causes a redistribution of the moisture. It would appear, however, that the presence of the moisture is in itself not the cause of the detrimental effects observed, for a vigorous growth of molds was always produced on sterilized dung, and while it was found that sterilizing in an autoclave produced only slight changes in the amount of moisture it did increase it. The probability is that the excessive amount of moisture favored the growth of other organisms which were detrimental to the growth of the mucors. This point will be discussed later. It is to be noted further that sterilized dung, even when fairly dry, produced a luxuriant growth of mucors and that they persisted on it until the dung was apparently thoroughly air dry, while they always disappeared from the unsterilized dung in less than ten days and while it was still quite moist.

The experiments already mentioned having apparently eliminated the possibility of the mucors causing their own death in the original cultures by either excreting toxins or using up all of the available food supply, it became advisable to test the effect of the growth of the other fungi on both of the molds. This was done on dung in Erlenmeyer flasks. This method proved to be particularly convenient as infections could easily be prevented, and so it was used almost exclusively in subsequent experiments. Fresh dung was collected, dried slightly, then mashed and thoroughly mixed, and a layer about 2 cm deep placed in the bottoms of the flasks. The mouths of the flasks were then plugged with absorbent cotton. Two of the flasks were kept as checks and the others sterilized by heating in an autoclave for fifteen minutes at 120° under a pressure of one kilo. This same method was always followed when Erlenmeyer flasks were employed.

In order to test the effect of the growth of the fungi on *Absidia caerulea,* fourteen 600 cc flasks were prepared as above on the thirteenth of March. Two were kept as checks and twelve sterilized. The latter were inoculated in duplicate on March 18th, as follows: 1, *Absidia caerulea;* 2, *A. caerulea* and *Mucor*

racemosa; 3, *A. caerulea* and *Oospora* sp.; 4, *A. caerulea* and *Coprinus stercorianus;* 5, *A. caerulea* and *Coprinus plicatilis;* 6, all five of the fungi mentioned above.

The growth in the unsterilized checks was quite similar to that in the unsterilized cultures previously described. There was a growth of mucors followed by *Oospora* and this in turn by *Coprini.* The growth of the mucors and *Oospora* was very scanty and disappeared in less than ten days.

The mucors and *Coprini,* with which the sterile dung was inoculated, commenced to grow immediately and in three days there was a vigorous growth of both. The growth of *Oospora* was not visible as soon as that of the other fungi, owing probably to its small size. The mucors reached their maximum development in five, and the *Coprini* in ten days. The growth of the individual fungi was in every case much greater than in any unsterilized check, while the total growth on the sterilized was always many times greater than on the unsterilized dung. There were so few hyphae in the unsterilized dung that they might easily have been overlooked on superficial examination, while in the sterilized they were so abundant that a compact felt was produced. In the flasks containing the *Coprini* this was so dense even after drying that water poured on the surface of the felt did not penetrate into the interior. All of the fungi moreover remained alive until after the substratum had apparently become air dry. Since *Absidia caerulea* grew very much better when grown on sterilized dung with any of all of the other fungi than it did in any of the unsterilized checks, and showed no signs of dying except with the drying out of the substratum, it would seem that neither any nor all of these fungi could have produced the deleterious effect observed. The vigorous growth of *Mucor racemosa* with all of the other fungi would indicate that the same thing was true in the case of this species, while the vigorous growth of the *Coprini* would, likewise, seem to show that the sterilization of the substratum was favorable to the vegetative development of these. They, however, produced very few fruit bodies, which would seem to be due to the vigorous growth of the hyphae having exhausted the substratum of food or moisture, before reaching the fruiting stage.

The growth of *Absidia caerulea* on the sterilized substratum appeared to be inversely proportional to that of the other fungi. It grew best when alone; next with *Oospora* which is a small and slow growing fungus; and poorest when with all of the other four fungi. *Mucor racemosa* is a much larger and more rapidly

growing species than *Absidia caerulea* and with it *A. caerulea* made a poorer growth than with any other single fungus. The *Coprini* finally produce a very rank growth, but at first are slow growing, which would seem to account for the fact that with them *Absidia caerulea* made a better growth than with *Mucor racemosa.* Owing to the slight difference in the appearance of the various fungi it is difficult to compare the total amount of hyphae in the flasks but it is doubtful if this varied far from the average in any of them.

These cultures of *Absidia caerulea* alone and with the other fungi show quite clearly that there may be a sharp competition between the various fungi growing in succession on dung, but at the same time they show equally clearly that this competition cannot explain the behavior of this mold on unsterilized dung.

Another series similar to that last described was run in duplicate in 450 cc Erlenmeyer flasks. The results appeared to be in every way similar to those just described except that the fungi were less vigorous in the 450 cc flasks than in those holding 600 cc. This difference in vigor was probably connected with the amounts of food and air available in the two sizes of flasks.

The experiments already reported having apparently proved that the early disappearance of *Absidia caerulea* in unsterilized cultures could not have been due to the presence of the other fungi considered, it remained to be seen if the same thing would hold for *Mucor racemosa.* On the 14th of March fourteen 600 cc flasks, containing dung, were prepared as described in the experiments with *Absidia caerulea,* two being kept as checks and 12 sterilized. The checks showed a succession similar to that described for other unsterilized cultures. This consisted of mucors followed by *Oospora* and this in turn by *Coprini.* The growth of the mucors and *Oospora* was very scanty and disappeared completely in nine days.

The sterilized flasks were inoculated in duplicate as follows: 1, *Mucor racemosa;* 2, *M. racemosa* and *Absidia caerulea;* 3, *M. racemosa* and *Oospora* sp.; 4, *M. racemosa* and *Coprinus stercorianus;* 5, *M. racemosa* and *Coprinus plicatilis;* 6, all of the five just mentioned. The results obtained were quite similar to those given in the case of *Absidia caerulea.*

The mucors and *Coprini* commenced to grow immediately and in three days had made a vigorous growth. As in the cultures of *Absidia,* the growth of *Oospora* did not become visible as soon as the other fungi, probably owing to its small size. The mucors apparently reached their maximum development on the

fifth and the *Coprini* on the tenth day. In every case the fungi made a much greater growth than in the unsterilized flasks, and continued to appear vigorous until after the substratum had become air dry. In this case, as in the previous flasks with *Absidia caerulea*, the growth of the hyphae of the *Coprini* was so vigorous that dense felt-like masses were formed, whereas these hyphae could not be distinguished in a superficial examination of the unsterilized cultures, the presence of the *Coprini* being recognized only by their fruit bodies.

The total growth of hyphae was many times greater in all of the sterilized flasks than in any of the unsterilized ones. As in the case of *Absidia caerulea*, the amount of growth made by *Mucor racemosa* varied inversely to that of the other fungi. The greatest growth of *Mucor racemosa* was obtained when it was grown alone, the next best with the small and slow growing *Oospora*, and the poorest with all of the other fungi. The growth with *Absidia caerulea*, *Coprinus stercorianus* and *C. plicatilis* was about equal and intermediate between that with *Oospora* and with all. It is probable that the total amount of growth did not vary greatly in any of the flasks.

Series similar to the above were run in duplicate in both 450 and 1,000 cc flasks. The results obtained from these appeared to be entirely similar to those just given, except that the individual fungi made a greater growth in the 600 cc than the 450 cc flasks and a still greater growth in those holding 1,000 cc. As in the case of the preceding series, this was probably due to the different amounts of food and air present in the different flasks.

The experiments with *Mucor racemosa* show that when this species is grown with other fungi there is a sharp competition which results in a retardation of its growth but at the same time the results do not explain its behavior in the unsterilized cultures. In the latter it made a very spindling growth and always disappeared in less than ten days while when grown on sterile dung with any or all of the fungi considered the growth was many times as great as on the unsterilized media and, moreover, continued to be vigorous until the substratum had apparently become air dry.

The experiments, so far reported, would seem to show that the succession of the fungi on the unsterilized dung was not due to any of three causes which are probably most frequently offered in explanation of the successions of higher plants, these being; the depletion of nutrient materials by the first plants of the succession; by the plants producing toxins which cause

their own disappearance; by the competition of the later plants of a succession when the substratum is prepared for them. They also show that variations in the moisture content of the substratum are not responsible for the succession.

The order in which the fungi become visible in the unsterilized cultures would appear to be due to their various rates of growth and not to some having started before the others. The mucors on sterilized media grow rapidly and fruit in three days. *Oospora* grows much more slowly and so does not become visible until after the molds. The difference in the rates of growth of these fungi on agar in test tubes is very striking. In three days the mucors fill the tubes while in the same time *Oospora* makes only a slight growth. The hyphae of the *Coprini* grow rapidly from the first on sterilized dung, while they can be distinguished only with difficulty in unsterilized cultures. In either case it takes them about ten days to fruit. It will thus be seen that their presence in unsterilized cultures would not be recognized until they had fruited or, in other words, not for ten days.

The difference in the growths obtained on sterilized and unsterilized dung would seem to show that the disappearance of the mucors and *Oospora* in the latter case was due to micro-organisms in the substratum. Probably the chief effect of sterilizing is the killing of all of the organisms. We have seen that the changes in the moisture content of the dung are insignificant, and it is not likely that the food supply is altered sufficiently to explain the results. A great variety of microörganisms occur in the dung in large numbers. These would certainly compete with the fungi for food and oxygen and in all probability would also excrete toxic substances which would be detrimental to them. If these microörganisms are allowed to remain in the dung for ten days it will not support the Mucors even when inoculated with them. If now it is sterilized with either steam, chloroform or formalin, which three methods were tried, it will again support a vigorous growth of fungi. The steam might cause the volatilization of toxic organic compounds but it is not likely that the latter would be destroyed by both chloroform and formalin. From this it would seem that the removal of the competition of the microörganisms is sufficient to prevent the early disappearance of the molds, but it is also quite probable that the microörganisms excrete substances which are harmful to the fungi although definite proof of this is lacking.

From the foregoing it is evident that the order in which the fungi appear in unsterilized cultures is due to their different

rates of growth, and the disappearance of the mucors and *Oospora* to the presence of microörganisms in the substratum. The *Coprini* appear to be more resistant to the effect of the microörganisms although the growth of their vegetative hyphae is greatly disminished.

The deleterious effects which the microörganisms have on the growth of the fungi under consideration is apparently quite similar to their action on vascular plants. The fungi may themselves excrete toxic compounds but the effect of such substances must be small when compared with that of the microörganisms.

SUMMARY

The succession of fungi on dung cultures in Manila is very similar to that reported from temperate regions. Typically it consists of Mucors followed by *Oospora* and in turn by *Coprini*. The Mucors and *Oospora* disappear in less than ten days while the fruit bodies of the *Coprini* are produced over a considerable period.

The order in which the fungi become visible is probably due to their different rates of growth, while the disappearance of the *Mucors* and *Oospora* is connected with the presence of microorganisms in the substratum.

The fungi considered may excrete toxic substances, and in all probability diminish the food supply, but neither of these factors appear to be influential in causing the succession. When the mucors are grown on sterilized dung they make a growth many times greater than on unsterilized and, moreover, continue to appear vigorous until after the substratum is apparently air dry.

The competition of the other fungi considered, causes a restriction in the growth of the mucors on sterilized dung. This restriction is, however, so slight as to apparently exclude the idea that such a competition may be the cause of the death of the molds in the unsterilized cultures.

As the substratum dries, all of the fungi cease growing but there is no evidence that this factor affects one species sooner than the others, and it is certainly not responsible for the death of the mucors on unsterilized media.

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STUDIES ON PHILIPPINE RUBIACEAE, I

By E. D. MERRILL *

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

One plate.

The present paper consists mainly of diagnoses and descriptions of presumably previously undescribed forms, thirty-five species in thirteen genera being characterized. One genus, *Acranthera,* is definitely recorded from the Archipelago, although its occurrence here has already been mentioned by Mr. Elmer. Some notes on nomenclature are included, and a few new combinations have been made in view of the provisions as to priority in the accepted code of botanical nomenclature.

In the genus *Nauclea* the current conception of its limits has been accepted, but it is worthy of note that *Nauclea* of modern botanists is scarcely the *Nauclea* of Linnaeus. Depending entirely on an interpretation of just what is the type of the Linnean genus, it seems probable that those species now classified under *Sarcocephalus* will have to be transferred to *Nauclea* and that *Bancalus* O. Kuntze will have to be accepted for *Nauclea* of all modern authors, not of Linnaeus.

Notwithstanding the large amount of work that has been done on Philippine *Rubiaceae* within the past ten years, especially by Mr. Elmer, and to a less degree by myself, a relatively large number of forms, many of which are apparently undescribed, still remain to be studied in the herbarium of the Bureau of Science, while additional new ones are being constantly received as exploration progresses. It seems to be apparent that in the total number of species the *Rubiaceae* will rank second in the list of Philippine families, being exceeded only by the *Orchidaceae.* Many of the species are of common occurrence in the Archipelago, and are of very wide extra-Philippine distribution, but a very high percentage, especially the sylvan forms, are very local in occurrence, and the percentage of endemism, for the family as a whole, is rather high.

*Associate Professor of Botany, University of the Philippines.

ACRANTHERA Arnott

ACRANTHERA PHILIPPINENSIS sp. nov.

Suffruticosa, simplex, usque ad 60 cm alta, infra prostrata, omnibus partibus plus minusve pilosis; foliis oblongis vel oblongo-obovatis, chartaceis, usque ad 25 cm longis, acutis vel late brevissime acuminatis, basi decurrento-acuminatis, nervis utrinque circiter 10; cymis terminalibus, amplis, dense multifloris, bracteis circiter 2.5 cm longis; floribus 4- vel 5-meris, roseis, circiter 1.5 cm longis; fructibus anguste oblongis, 2 cm longis, lobis accrescentibus coronata.

An ascending, suffrutescent, unbranched plant 60 cm high or less, the stems usually prostrate below, subterete, densely pilose with pale-brownish or grayish hairs. Leaves oblong or oblong-obovate, chartaceous, 10 to 25 cm long, 3 to 10 cm wide, the lower surface somewhat paler than the upper when dry, both surfaces with scattered pilose hairs, the lower one also densely pilose on the midrib and lateral nerves, apex acute or very shortly and broadly acuminate, the base narrowed, decurrent-acuminate; nerves about 10 on each side of the midrib, prominent beneath, curved-ascending, the reticulations rather lax; petioles densely pubescent, 2 to 7 cm long; stipules ovate, pubescent, about 2.5 cm long. Cymes terminal, densely many flowered, pilose, 7 to 10 cm in diameter, the bracts pubescent, oblong, acuminate or acute, about 2.5 cm long, 1 cm wide, the bracteoles similar but smaller, not involucrate. Calyx-tube of nearly mature buds oblong, densely villous, about 4 mm long, the lobes pink, 4 or 5, oblong, about 8 mm long, 2 to 3 mm wide. Corolla-tube 6 to 7 mm long, the lobes broadly ovate, rounded, white, about 3 mm long. Anthers linear, 6 mm long. Fruit narrowly oblong, villous, about 2 cm long, 3 to 4 mm in diameter, villous, crowned by the persistent, accrescent calyx-lobes which are oblong, 1 to 1.5 cm long, 3 to 6 mm wide.

MINDANAO, District of Zamboanga, Sax River, *Merrill 8309* (type), November 27, 1911, in ravines along small, streams, altitude 700 to 900 m, *Williams 2357*, February, 1905.

The genus is new to the Philippines, although Williams' specimen was determined to the genus by Doctor C. B. Robinson, but nothing further was done with it as the corolla was lacking. It appears to be well characterized by its ample cymes, its 5-, more rarely 4-merous flowers, and its accrescent calyx-lobes. It has somewhat the general appearance of *Acranthera zeylanica* Arn., but does not appear to be closely allied to that species.

HEDYOTIS Linnaeus

HEDYOTIS CAUDATA sp. nov.

Frutex erectus (vel scandens?) glaber, ramulis obtuse angulatis; foliis chartaceis, nitidis, ovatis vel oblongo-ovatis, usque ad 12 cm longis, petiolatis, apice caudato-acuminatis, nervis utrinque 7 vel 8, haud prominentibus; stipulis brevibus, laciniatis; inflorescentiis paniculatis, laxis; floribus circiter 5 mm longis, bracteolis ciliatis.

An erect or scandent glabrous shrub, the branchlets slender, green, somewhat quadrangular, the angles rounded, the internodes 6 to 10 cm long. Leaves ovate to oblong-ovate, chartaceous, somewhat shining, rather pale, and of about the same color on both surfaces when dry, 6 to 12 cm long, 3 to 4 cm wide, base acute, apex rather slenderly caudate-acuminate; nerves 7 or 8 on each side of the midrib, not prominent, the reticulations obscure; petioles 5 to 10 mm long; stipules 4 to 5 mm long, laciniately 3- to 5-toothed, the teeth narrow, prominently pubescent. Inflorescence paniculate, terminal and in the uppermost axils, sessile and branched from the base, or peduncled, lax, the branches usually 4 at each node, spreading, the branchlets also arranged in threes or fours. Flowers white, their pedicels 3 to 5 mm long, subtended by oblong to oblong-ovate, prominently ciliate, 1 to 1.5 mm long bracteoles, the bracts of the ultimate branchlets linear, 3 to 4 mm long, ciliate, those of the primary branches similar but twice as long and glabrous. Corolla-tube about 2 mm long, glabrous on both surfaces, the lobes 4, oblong, obtuse, 2.5 mm long. Calyx glabrous, somewhat urceolate, about 2.5 mm long, 4-lobed, the lobes oblong, acuminate, about 1.5 mm long. Filaments slender, exserted; anthers narrowly oblong, 1.2 mm long. Fruit unknown.

LUZON, without definite locality, *Loher 6419*.

A species perhaps most closely allied to *Hedyotis scandens* Roxb., which extends from India and Burma to southern China, but with differently shaped leaves, quite different stipules, more lax inflorescence, and the corolla quite glabrous, not bearded within.

HEDYOTIS HUMILIS sp. nov.

Suffruticosa, erecta, glabra, 30 ad 60 cm alta, haud ramosa, caulibus teretibus, circiter 3 mm diametro, partibus junioribus distincte 4-angulatis; foliis lanceolatis, 4 ad 5 cm longis, acuminatis, utrinque subaequaliter angustatis, nervis lateralibus subobsoletis; inflorescentiis axillaribus, longe graciliter pedunculatis, paucifloris, 7 ad 12 cm longis; corolla 6 mm longa, intus villosa.

An erect, unbranched, glabrous, suffrutescent plant, or an undershrub, 30 to 60 cm high. Stems terete, brownish, about 3 mm in diameter, the younger parts distinctly 4-angled. Leaves lanceolate, membranaceous, equally narrowed and acuminate at both ends, 4 to 5 cm long, 1 to 1.5 cm wide; lateral veins very slender, scarcely visible to the naked eye, 3 or 4 on each side of the midrib, sometimes obsolete or subobsolete; petioles slender, 3 to 8 mm long; stipules lanceolate, 5 to 6 mm long, pectinate, the lobes linear, 2 to 3.5 mm long. Inflorescence axillary, long- and slenderly peduncled, paniculate, few-flowered, 7 to 12 cm long, lax, the bracteoles lanceolate, acuminate, 4 to 5 mm long, the pedicels slender, 5 to 8 mm long. Calyx-tube somewhat ovoid, about 2 mm long, the lobes 4, lanceolate, acuminate, 3 mm long. Corolla white, 6 mm long, villous inside, the lobes 4, ovate, acute, 2 mm long. Anthers included, 1.5 mm long. Capsule narrowly obovoid, 2.5 to 3 mm long, base acute, calyx-lobes persistent.

CAMIGUIN DE MINDANAO, Mount Mahinog, in the mossy forest, *Bur. Sci. 14691 Ramos*, April, 1912.

A very characteristic species, recognizable by its habit, its small size, lanceolate nearly nerveless leaves, lax inflorescence, and long peduncles. It somewhat resembles *Hedyotis rhinophylla* Thw., in gross characters, but is not closely allied to that species, which, among many other characters, differs from *Hedyotis humilis* in its terminal, not axillary inflorescence.

HEDYOTIS PHANEROPHLEBIA sp. nov. § *Diplophragma.*

Frutex glaber, ut videtur erectus, ramis teretibus vel obscure angulatis, internodiis brevibus, stipulis laciniato-pectinatis; foliis oblongo-ovatis, chartaceis vel subcoriaceis, petiolatis, acuminatis, usque ad 9 cm longis, nervis utrinque 5 vel 6, prominentibus, adscendentibus; inflorescentiis terminalibus, laxis, paniculatis, paucifloris; fructibus circiter 7 mm longis.

An erect glabrous shrub, the branches rather stout, subterete or obscurely angled, pale, smooth. Leaves oblong-ovate, chartaceous or subcoriaceous, somewhat shining when dry, 5 to 9 cm long, 2 to 3 cm wide, acuminate, base acute; nerves 5 or 6 on each side of the midrib, very prominent, sharply ascending; petioles about 1 cm long; stipules about 1 cm long, prominently laciniate-pectinate, the narrow lobes 3 to 5 mm long. Inflorescence terminal, paniculate, rather lax, 8 cm long or less, the branches opposite, the branchlets also in pairs. Flowers white, their pedicels 6 to 15 mm long, subtended by linear-lanceolate bracteoles, about 6 mm long, 1 mm wide. Calyx 6 mm long, the tube funnel-shaped, base acute, the lobes oblong-lanceolate, acuminate, about 3.5 mm long, reticulate-nerved. Corolla about

6 mm long, white, becoming black in drying, the lobes oblong-ovate, as long as the tube, densely villous on their inner surfaces. Anthers 2 mm long. Capsules ovoid, about 4 mm long, crowned by the persistent calyx-lobes, the whole capsule about 7 mm in length, the capsule proper splitting septicidally into two dehiscent, 1- (or few-) seeded cocci.

MINDANAO, Province of Misamis, Mount Malindang, *For. Bur. 4552 Mearns & Hutchinson*, May, 1906, altitude about 1,800 m, in forests.

A species well characterized by its laciniate-pectinate stipules, its very prominently nerved leaves, and its comparatively large capsules, the calyx being especially notable.

HEDYOTIS RAMOSII sp. nov.

Herba subprostrata, ramis elongatis, omnibus partibus plus minusve ciliato-hirsutis; foliis oblongo-lanceolatis vel late lanceolatis, chartaceis vel submembranaceis, acuminatis, basi acutis vel obtusis, usque ad 5 cm longis, nervis utrinque 4 vel 5, adscendentibus; stipulis connatis, longe ciliato-laciniatis; cymis axillaribus, brevibus, sessilibus vel brevissime pedunculatis, floribus 4-meris, calycis lobis lanceolatis, 1.2 mm longis.

A subprostrate or spreading, apparently annual herb, the branches elongate, up to 60 cm in length, often rooting at the lower nodes, the stems 2 mm thick or less, subterete or obscurely angled, ciliate-hirsute. Leaves oblong-lanceolate to broadly lanceolate, chartaceous or submembranaceous, rather dark-colored when dry, the lower surface a little paler than the upper, 2.5 to 5 cm long, 7 to 15 mm wide, with scattered, brownish hairs on the upper surface, the lower surface prominently ciliate-hispid on the midrib and lateral nerves, the apex acuminate or sharply acute, the base acute or obtuse; lateral nerves 4 or 5 on each side of the midrib, ascending, not very prominent, the reticulations obsolete; petioles 1 to 3 mm long, hirsute; stipules membranaceous, connate, ciliate-hirsute, 1 cm long or less, the free parts very broadly triangular-ovate, with from 7 to 10, filiform, ciliate segments 2 to 7 mm in length. Cymes axillary, sessile or shortly peduncled, ciliate-hispid, rather dense, few-flowered, the flowers 6 to 10 in each cyme, the bracts lanceolate, acuminate, 1.5 mm long, the pedicels about 2 mm long. Calyx ciliate-hispid, the tube more or less urceolate, about 1 mm long, the lobes 4, oblong-lanceolate, acuminate, 1 to 1.2 mm long. Corolla about 2 mm long, the lobes ciliate-hispid. Capsule obovoid, about 1.2 mm long, slightly ciliate-hispid, crowned by the persistent calyx-lobes.

LEYTE, mountains back of Dagami, *Bur. Sci. 15337 Ramos*, August, 1912, in forests.

A species apparently allied to *Hedyotis connata* Wall., but among many other characters distinguishable by its indumentum. It has much the general appearance of *H. auricularia* L., but differs in many essential characters.

HEDYOTIS SUBEVENOSA sp. nov.

Frutex glaber circiter 1 m altus, erectus, ramis teretibus, ramulis obscure rotundato-angulatis; foliis oblongis vel late oblongo-lanceolatis, acuminatis, basi acutis, usque ad 13 cm longis, nervis utrinque circiter 6, obscuris, reticulis obsoletis; petiolo 3 ad 5 mm longo; paniculis terminalibus et in axillis superioribus, laxis, circiter 6 cm longis, ramis verticillatis; floribus circiter 5 mm longis.

An erect, glabrous shrub, about 1 m high, the stems grayish, terete, the branchlets also terete or obscurely obtuse-angled. Leaves oblong to broadly oblong-lanceolate, chartaceous, pale, of the same color on both surfaces and somewhat shining when dry, 6 to 13 cm long, 2 to 4 cm wide, narrowed at both ends, base acute, apex acuminate; nerves about 6 on each side of the midrib, very slender, faint, not at all prominent, the reticulations obsolete; petioles 3 to 5 mm long; stipules ovate, 5 mm long or less, somewhat acuminate, usually about 3-toothed or 3-cleft at the apex. Inflorescence paniculate, rather lax and open, terminal and in the uppermost axils, 4 to 6 cm long, usually branched from the base, the branches and branchlets verticillate. Flowers white, the pedicels 1 to 2 mm long, the bracteoles shorter than the pedicels. Calyx about 2 mm long, somewhat urceolate, the lobes 4, oblong-ovate, obtuse, 0.8 mm long. Corolla-tube about 1.5 mm long, the lobes oblong-ovate, obtuse or subacute, 1.5 to 2 mm long. Capsule ovoid, 3 mm long.

LUZON, Province of Cagayan, Abulug River, *Weber 1563* (type), *For. Bur. 19619 Curran, Bur. Sci. 14503 Ramos*, January, 1912, said to be common in forests, altitude 180 to 250 meters.

A species well characterized by its small flowers and its petioled, pale, nearly nerveless leaves. It is similar in many respects to *Hedyotis acutangula* Champ. of southern China, but has petioled leaves and terete stems. From *Hedyotis vachellii* Benth. it differs in its smaller flowers and toothed stipules.

HEDYOTIS PROSTRATA (Blume) Korth. in Nederl. Kruidk. Arch 2² (1851) 160; Valeton in Engl. Bot. Jahrb. 44 (1909) 544. (var. *robustior*). (Plate I.)

Metabalos prostratus Bl. Bijdr. (1826) 991.

Doctor Valeton considers *Hedyotis congesta* R. Br. in Wall. Cat. (1829) No. 844, *nomen*, G. Don Gen. Syst. 3 (1834) 525, to be a synonym of *Hedyotis prostrata* (Blume) Korth., and refers to the species *Elmer 9153* (not *4153* as cited), a Philippine specimen that I have not seen. I have

no doubt but that it is the common and widely distributed local form that has for the most part been determined and distributed as *Hedyotis congesta* R. Br. In order more definitely to determine the status of *Hedyotis prostrata* (Blume) Korth., I requested the Director of the Rijks Herbarium to compare Blume's type with recently collected Philippine material, and to inform me as to whether or not the Philippine and Javan material represented the same species. Instead of making the comparison he kindly loaned me two Javan sheets collected and named by Blume as *Metabolos prostrata*, one of which is presumably Blume's type. Both sheets manifestly represent the same species, and a photograph of one of them is reproduced herewith. Blume's specimens are very closely matched by a number of Philippine plants, and there is little doubt but that a single variable species is represented. If, however, the species is to be considered as a collective one, the oldest valid specific name is *Hedyotis philippensis* (Willd.) Merr., which, as *Spermacoce*, antedates Blume's *Metabolos prostrata* by about one year.

Of the species involved, I have, at one time or another, examined the types of *Spermacoce philippensis* Willd., *Metabolus laevigatus* DC. (*Sclerococcus laevigatus* Bartl., *Hedyotis laevigatus* Miq.), *Spermacoce meyeniana* Walp., and *Metabolos prostrata* Blume. I have not seen the type of *Hedyotis congesta* R. Br., but there is little doubt but that Valeton is correct in his reduction of this species to *Hedyotis prostrata* (Blume) Korth.

HEDYOTIS PHILIPPENSIS (Willd.) Merr. ex C. B. Rob. in Philip. Journ. Sci. 6 (1911) Bot. 222.

Spermacoce philippensis Willd. ex Spreng. Syst. 1 (1825) 401; Miq. Fl. Ind. Bat. 2 (1856) 333; F.-Vill. Novis. App. (1880) 113 (*philippinensis*).

Metabolus laevigatus DC. Prodr. 4 (1830) 436.

Sclerococcus laevigatus Bartl. ex DC. l. c. in syn.

Hedyotis laevigatus Miq. Fl. Ind. Bat. 2 (1856) 178.

This species is closely allied to *Hedyotis prostrata* (Blume) Korth., of Java and Borneo, and differs chiefly in its erect habit and its slightly scabrid leaves. A whole series of Philippine specimens that have largely been determined as *Hedyotis congesta* R. Br., show all stages of variation from the perfectly glabrous form, described by Walpers as *Spermacoce meyeniana*, and very close to *Hedyotis prostrata* Korth., to the slightly scabrid leaves and branchlets of *H. philippensis*.

Fairly typical *Hedyotis philippensis* (Willd.) Merr., is represented by the following specimens, which, for the most part, are found at higher altitudes than the quite glabrous form considered below under the variety *meyeniana*:

LUZON, without definite locality, *"Malaspina"* (type in herb. Willdenow); *Haenke* (type of *Metabolus laevigatus* Bartl., herb. Prag.): Benguet Subprovince, *Bur. Sci. 2481, 2528, 2787 Mearns, For. Bur. 4912 Curran, Merrill 7707*: Province of Bataan, Mount Mariveles, *Bur. Sci. 6204 Robinson, For. Bur. 1578, 1583 Borden, Elmer 6822, Merrill 3243, 3894*; Province of Pampanga, Mount Arayat, *Merrill 3929*: Province of Nueva Vizcaya, *Bur. Sci. 8182 Ramos, For. Bur. 19040 Madamba*. NEGROS, Canlaon Volcano, *Merrill 7280*.

Var. **MEYENIANA** (Walp.) comb. nov.

Spermacoce meyeniana Walp. in Nov. Act. Acad. Nat. Cur. 19 (1843) Suppl. 1: 353; F.-Vill. Novis. App. (1880) 113.

This form is very similar indeed to the species, *H. philippensis*, but its leaves and branchlets are entirely smooth and glabrous. It approaches very closely to *Hedyotis prostrata* (Blume) Korth., and is doubtless the Philippine form referred to the latter species by Valeton,[1] who cites, by error, *Elmer 4133* instead of *9153*, a specimen I have not seen. See above under *H. prostrata*. The question as to whether or not *Spermacoce meyeniana* Walp., is absolutely identical with *Hedyotis prostrata* Korth., will have to be left to the future monographer who may have an opportunity of making direct comparisons of the types.

Hedyotis philippensis var. *meyeniana* (Walp.) Merr., is represented by a large series of specimens, as follows: LUZON, Province of Isabela, *Bur. Sci. 7974 Ramos:* Province of Zambales, *Bur. Sci. 4758 Ramos:* Province of Pangasinan, *Bur. Sci. 4896 Ramos:* Province of Laguna, *Meyen* (type in herb. Berol.), *Bur. Sci. 9743 Robinson, For. Bur. 13319 Tamesis:* Province of Rizal, *Loher 6358:* Province of Bataan, Mount Mariveles, *For. Bur. 3061, 1224, 2379 Borden, Whitford 212, Williams 622, Copeland 287, Merrill 3753, Phil. Pl. 779 Merrill.* POLILLO, *Bur. Sci. 6832 Robinson.* MINDORO, *For. Bur. 8837, 9953, 12137 Merritt.* NEGROS, *Whitford 1494.* BASILAN, *For. Bur. 4003 Hutchinson, Bur. Sci. 9988 Robinson.*

Many of the above specimens have been determined and distributed as *Hedyotis congesta* R. Br., a manifestly allied species, which Valeton has reduced to *H. prostrata* Korth.

Var. **ASPERRIMA** var. nov.

A typo differt foliis pallidioribus ramulis foliisque utrinque dense minuteque asperulis.

PALAWAN, Malampaya Bay, *Merrill 7252* (type). CULION, *Merrill 487, 434*, December, 1902, in dry forests and thickets.

The leaves are so exceedingly scabrid that the form has been designated as above, although it may prove to be worthy of specific rank.

HEDYOTIS COSTATA (Roxb.) Kurz in Journ. As. Soc. Beng. 45 [2] (1876) 135.

Spermacoce costata Roxb. Hort. Beng. (1814) 10, *nomen;* Fl. Ind. 1 (1832) 370.

Metabolus lineatus Bartl. in DC. Prodr. 4 (1830) 435, non *Hedyotis lineatus* Roxb.

Hedyotis vestita R. Br. in Wall. Cat. (1829) no. 847, *nomen;* G. Don Gen. Syst. 3 (1834) 526.

Metabolus caeruleus Blume Bijdr. (1826) 992, non *Hedyotis coeruleus* W. & A.

LUZON, Province of Laguna, Los Baños, *Holman 86;* San Antonio, *Bur. Sci. 10991 Ramos:* Province of Rizal, *Loher 6349, Bur. Sci. 3352, 5209 Ramos.* PALAWAN, *Merrill 5248.* CULION, *Merrill 541.*

Roxburgh's specific name *costata* is the oldest valid one for this widely

[1] Engl. Bot. Jahrb. 44 (1909) 544.

distributed species, and is here adopted, following Kurz. Both as a *nomen nudum* (1814), and as a valid publication (1832) it antedates the similar uses of the specific name *vestita*. Two other early names, *Metabolus lineatus* Bartl. (1830), and *Metabolus caeruleus* Blume (1826), are invalidated in *Hedyotis* by other authors having already used both names for different species. The use of *Hedyotis costata* R. Br. in Wall. Cat. No. 6198, dates from 1831 or 1832, but does not invalidate *H. costata* Kurz, as it is only a *nomen nudum*.

IXORA Linnaeus

IXORA PILOSA sp. nov.

Frutex, ramulis subtus foliis inflorescentiisque valde ciliato-pilosis; foliis lanceolatis vel oblongo-lanceolatis, acuminatis, usque ad 15 cm longis, basi obtusis, breviter petiolatis; inflorescentiis terminalibus, laxis, paucifloris, floribus 4-meris, bracteolatis, corollae tubo ciliato, 11 mm longo.

A shrub, the branchlets, lower surface of the leaves, petioles, and inflorescence prominently ciliate-pilose. Leaves lanceolate to oblong-lanceolate, chartaceous, 9 to 15 cm long, 2 to 3.5 cm wide, base somewhat narrowed, obtuse, apex distinctly acuminate, brownish when dry, the upper surface slightly shining, somewhat ciliate when young, glabrous when mature, the lower surface slightly paler, prominently ciliate-pilose on the midrib, nerves, and primary reticulations, the hairs pale, spreading; nerves 10 to 12 on each side of the midrib, prominent beneath, anastomosing, the reticulations lax; petioles pilose or pubescent, about 5 mm long; stipules setaceous, pilose, 8 to 10 mm long. Cymes terminal, peduncled, lax, few-flowered, all parts prominently ciliate-pilose, the peduncles usually 3 cm long, dichotomous, the branches spreading; bracts and bracteoles linear-lanceolate, acuminate, about 2 mm long; pedicels about 8 mm long. Calyx ovoid, ciliate, about 2.5 mm long, the teeth 4, oblong-lanceolate, acute or acuminate, 1 mm long. Corolla-tube about 11 mm long, 1 mm in diameter, cylindric, outside prominently ciliate with spreading hairs, the lobes spreading, revolute, when spread out about 6 mm long, 2.2 mm wide, obtuse; filaments exserted about 3 mm.

LUZON, Province of Tayabas, Tagacauayan, *Bur. Sci. 13371 Ramos*, March, 1911.

A strongly marked species, differing from all the Philippine forms in its pubescence, and especially in its ciliate corolla-tube.

IXORA PROPINQUA sp. nov.

Frutex glaber 3 and 4 m altus; foliis oblongis, chartaceis vel subcoriaceis, petiolatis, usque ad 15 cm longis, in siccitate haud nitidis, apice obtusis, basi acutis, nervis utrinque 10 ad 13,

distinctis; inflorescentiis terminalibus, cymosis, multifloris; floribus 4-meris, rubris, bracteolatis, calycis brevibus, dentibus obtusis, quam tubus brevioribus, corollae tubo 4 cm longo.

A glabrous shrub 3 to 4 m high, the branches terete, brownish, smooth. Leaves oblong, 8 to 15 cm long, 3 to 5 cm wide, chartaceous or subcoriaceous, of the same color on both surfaces when dry, scarcely shining, the apex blunt, rarely nearly acute, not at all acuminate, base acute; nerves 10 to 12 on each side of the midrib, spreading, anastomosing near the margin, distinct, the reticulations evident, rather lax; petioles 5 to 10 mm long; stipules broad, about 4 mm long, shortly acuminate. Inflorescence cymose, terminal, the panicle, excluding the corollas, 7 cm long or less, with numerous short branches, the bracts triangular-ovate, acuminate or acute, about 2.5 mm long, the pedicels 3 mm long or less, each with a pair of bracteoles similar to the bracts but about 1.5 mm long. Calyx above the bracteoles subcylindric, 3.5 to 4 mm long, the lobes 4, broadly ovate to subreniform, rounded, 1 to 1.2 mm long. Corolla red, showy, the tube slender, cylindric, about 4 cm long, 1.5 mm in diameter, the lobes 4, spreading, elliptic-ovate, acute or somewhat acuminate, about 10 mm long, 5 to 5.5 mm wide, prominently reticulate-veined. Style exserted about 2 mm, the arms stout, recurved, about 1 mm long. Anthers 2.5 mm long, exserted. Fruit unknown.

MINDANAO, Sax River Mountains, back of San Ramon, *Merrill 8254*, November, 1911, in damp forests, altitude about 800 m.

A species manifestly closely allied to *Ixora fulgens* Roxb., of the Malay Peninsula and Archipelago, differing in a comparatively small degree. The most notable differences are that the leaves are not shining, not at all acuminate but merely blunt or at most acute, and the stipules have a short, not elongate point. My conception of *Ixora fulgens* Roxb., is based on King's interpretation of the species,[2] not that of Hooker f.,[3] the latter's description of *Ixora fulgens* applying to *Ixora lobbii* Loud., *fide* King *l. c.*

NAUCLEA Linnaeus

NAUCLEA CORDATULA sp. nov.

Arbor parva, glabra vel subglabra; foliis oblongis vel oblongo-ovatis, coriaceis, usque ad 20 cm longis, basi late rotundato-cordatis, apice latissime rotundato-acuminatis vel obtusis, supra nitidis, subtus pallidioribus, nervis utrinque 11, subtus prominentibus; pedunculis ternatis, ad apicem bibracteatis, bracteis oblongis, 5 mm longis, caducis; capitulis (in alabastro) globosis, 1 ad 1.5 cm diametro, calycibus haud concretis, ebracteolatis.

[2] Journ. As. Soc. Beng. 73 [2] (1904) 79. [3] Fl. Brit. Ind. 3 (1880) 146.

A small tree, glabrous or nearly so. Branches grayish, somewhat compressed, sparingly lenticellate, the younger ones very obscurely puberulent. Leaves oblong to oblong-ovate, 15 to 20 cm long, 5 to 8 cm wide, coriaceous, somewhat brownish when dry, the upper surface shining, the lower a little paler and dull, base broadly rounded-cordate, only a little narrowed below the middle, the sinus about 3 mm deep, the lateral lobes very broad, rounded, apex very broadly rounded-acuminate or obtuse; lateral nerves 11 on each side of the midrib, prominent on the lower surface, very obscurely anastomosing, the reticulations not prominent; petioles 5 to 10 mm long, when young obscurely puberulent; stipules oblong, rounded, about 1 cm long, slightly pubescent, deciduous. Peduncles terminal, in threes, about 4 cm long, very obscurely puberulent or nearly glabrous. Heads (in bud) globose, 1 to 1.5 cm in diameter, yellowish-brown when dry, subtended by two, oblong, pubescent, early deciduous bracts which are about 5 mm in length; bracteoles none. Calyx-tubes not united, rather densely pale-hirsute, the tips of the calyx-lobes densely puberulent, yellowish-brown.

CEBU, Pugalason, *For. Bur. 22219 Cenabre*, December, 1910, on ridges, altitude about 1,000 meters, locally known as *hambabalog*.

A rather strongly marked species, characterized by its leaves being broadly rounded-cordate at the base, oblong, and blunt or very broadly blunt-acuminate at the apex, most closely allied to *Nauclea bartlingii* DC. and *N. vidalii* Elm.

NAUCLEA PUBERULA sp. nov.

Arbor parva, ramulis junioribus pedunculis petiolis subtus foliisque minute griseo-puberulis; foliis chartaceis, oblongo-ovatis, usque ad 22 cm longis, breviter latissime acuminatis vel obtusis, basi rotundatis vel acutis, nervis utrinque 8 ad 10; capitulis solitariis ternatis vel paniculatis, in anthesi circiter 3.5 cm. diametro, floribus ebracteolatis.

A tree, the young branchlets, petioles, peduncles, and the lower surfaces of the leaves, at least on the midrib and nerves, minutely grayish-puberulent. Branches terete, light-gray, glabrous. Leaves oblong-ovate, chartaceous, 11 to 22 cm long, 4 to 11 cm wide, the base rounded or acute, the apex very broadly blunt-acuminate or obtuse, the upper surface glabrous, subolivaceous when dry, slightly shining, the lower somewhat paler and somewhat brownish-yellow; lateral nerves 8 to 10 on each side of the midrib, prominent, faintly anastomosing, the primary reticulations slender, distinct, rather lax, subparallel; petioles 1 to 3 cm long; stipules deciduous, not seen. Peduncles up to 5

cm in length, solitary, in threes, or the central one trichotomously branched and bearing three heads, minutely puberulent, with scars of fallen bracts near their apices within 5 mm or less of the head. Heads globose, in bud densely gray-pubescent, in anthesis about 3.5 cm in diameter, the flowers ebracteolate. Calyx 3.5 to 4 mm long, ferruginous-hispid at the base, then nearly or quite glabrous, the upper 1.5 mm somewhat expanded and densely hirsute inside and out, the deciduous lobes densely pubescent. Corolla in anthesis narrowly funnel-shaped, 8 mm long, black when dry, quite glabrous, including the lobes, the lobes 5, oblong-ovate, obtuse, 2.5 mm long. Anthers 2 mm long. Styles exserted.

LUZON, Province of Sorsogon, Sorsogon, *Elmer 7319* (type), November, 1905, distributed as *Nauclea nitida* Havil. MINDORO, near Calapan, *For. Bur. 7855*, July, 1907, collector not indicated, locally known as *bagodilao*.

A species sufficiently well characterized by its minutely puberulent branchlets, peduncles, petioles, and lower surfaces of its leaves which have a yellowish-brown tinge when dry. The material available is not good, the type being rather poorly prepared, and the one other specimen seen in young bud only. Both specimens manifestly represent the same form, and are quite distinct from all our other material in the genus.

NAUCLEA OVATA sp. nov.

Arbor parva, inflorescentiis exceptis glabra; foliis ovatis, usque ad 16 cm longis, obtuse acuminatis, basi rotundatis, supra valde nitidis, subtus pallidioribus, nervis utrinque 7 ad 9; pedunculis solitariis vel binis, 4 ad 5 cm longis, apice bracteatis, bracteis parvis, deciduis; capitulis circiter 3.5 cm diametro, floribus ebracteolatis, calycis tubo irregulariter lacerato-dentato.

A tree, 20 m high *fide* Ramos, glabrous except the inflorescence. Branches terete, reddish-brown, rather slender. Leaves ovate, coriaceous, 9 to 16 cm long, 5 to 9 cm wide, the apex very broadly and obtusely acuminate, the base broad, rounded, sometimes very slightly decurrent, the upper surface very strongly shining, the lower much paler, dull; lateral nerves 7 to 9 on each side of the midrib, prominent, anastomosing, the reticulations slender, distinct, both the reticulations and nerves reddish-brown in contrast to the rather pale lower surface of the leaves; petioles 1 cm long; stipules not seen, very early deciduous. Peduncles solitary or in pairs, 4 to 5 cm long, glabrous, 2-bracteate at their apices, the bracts oblong, about 5 mm long, pubescent, very early deciduous. Heads, in flower, about 3.5 cm in diameter, white or yellowish. Flowers ebracteolate, the calyces free, the tube about 3 mm long, slightly pubescent, the limb after the fall of the lobes irregularly lacerate-toothed, somewhat

hirsute, the deciduous lobes narrowly club-shaped, 3 to 4 mm long, pubescent. Corolla 7 to 8 mm long, nearly glabrous, slightly enlarged upward, the lobes 5, oblong-ovate, obtuse, 1.5 mm long, slightly pubescent externally. Styles exserted about 6 mm; stigmas subglobose.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14597 Ramos*, April 27, 1912, in forests along streams near the old volcano.

A well marked species, characterized by its ovate, strongly shining, rather few nerved leaves and by its irregularly lacerate-toothed calyx-limb.

NAUCLEA KENTII sp. nov.

Arbor glabra (floribus ignotis); foliis oblong-obovatis, usque ad 32 cm longis, coriaceis vel subchartaceis, nitidis, apice breviter acuminatis, deorsum leviter angustatis, basi 2 ad 3 cm latis, abrupte rotundato-cordatis, nervis utrinque circiter 13, prominentibus; pedunculis terminalibus, solitariis, 5 ad 7 cm longis, capitulis fructicantibus globosis, 2.5 ad 3 cm diametro.

A glabrous tree, size not indicated. Branches grayish, subterete or somewhat compressed, wrinkled when dry, the internodes frequently swollen and hollow, inhabited by colonies of ants. Leaves oblong-obovate, coriaceous or subchartaceous, 20 to 32 cm long, 7 to 14 cm wide, the apex distinctly acuminate, slightly narrowed from above the middle to the abruptly rounded-cordate base, the base 2 to 3 cm wide, the sinus rather shallow, the lobes rounded, both surfaces shining, the lower a little paler than the upper; lateral nerves about 13 on each side of the midrib, prominent, somewhat ascending, straight below, curved and anastomosing towards their apices, the reticulations rather lax, distinct; petioles 1.4 to 2 cm long; stipules oblong, blunt, about 2.8 cm long, membranaceous, deciduous. Peduncles terminal, solitary, 5 to 7 cm long. Flowers unknown. Heads in fruit globose, 2.5 to 3 cm in diameter, the capsules about 14 mm long, their apices truncate, hirsute, about 3 mm in diameter, often depressed at the apex, the seeds very numerous, somewhat pubescent, narrowly winged at both ends, including the wings 3 to 3.5 mm long.

BASILAN, *Bur. Sci. 15440* (type), *16137 Reillo*, August, 1912, in forests.

Distinguishing characters of this species are its comparatively large leaves which are slightly narrowed from above the middle to the abruptly rounded-cordate base. The hollow branchlets, inhabited by ants, are not peculiar to the species but are found in several other representatives of the genus in the Philippines. Named in honor of Mr. Kent of the Bureau of Forestry, through whose interest I was enabled to send a collector to Basilan to work with his party.

NAUCLEA MINDANAENSIS sp. nov.

Arbor parva, 5 ad 10 m alta, inflorescentiis exceptis glabra vel subtus foliis parce pubescentibus; foliis oblongo-obovatis ad oblongo-oblanceolatis, usque ad 20 cm longis, acuminatis, infra angustatis, basi abrupte rotundato-cordatis, nervis utrinque circiter 11, prominentibus; pedunculis solitariis, 3 ad 5 cm longis, capitulis (in anthesi) 4 ad 5 cm diametro.

A small tree, glabrous or nearly so. Branches grayish, terete, wrinkled when dry, glabrous. Leaves oblong-obovate to oblong-oblanceolate, rarely obovate, coriaceous, 12 to 20 cm long, 3.5 to 9 cm wide, shining when dry, the lower surface a little paler than the upper one and sometimes slightly pubescent on the midrib and nerves, the apex distinctly acuminate, narrowed from about the middle to the abruptly rounded or rounded-cordate base, the base 1 to 2 cm wide; lateral nerves about 11 on each side of the midrib, prominent, obscurely anastomosing, the reticulations slender, rather distinct, somewhat lax; petioles 5 to 10 mm long; stipules oblong, obtuse, 2 to 2.5 cm long. Peduncles solitary, terminal, 3 to 5 cm long. Heads globose, in anthesis 4 to 5 cm in diameter, the bracts, if present, very early deciduous and at the apices of the peduncles. Calyces free, 3 mm long, angled, the tube truncate, pubescent at the apex, the bracteoles none. Corolla about 1.5 cm long, the tube slender, gradually widened upward, glabrous, 5-lobed, the lobes oblong-ovate, obtuse, 1.5 mm long, somewhat pubescent externally. Styles exserted about 8 mm, the stigmas obovoid.

MINDANAO, District of Zamboanga, Siay River, *For. Bur. 13385 Foxworthy, DeMesa, & Villamil,* May 29, 1912; San Ramon, *Copeland 1630* (type), February, 1905, *Williams 2148,* February, 1905. BASILAN, *For. Bur. 3972 Hutchinson,* January, 1906.

A species manifestly allied to *Nauclea kentii* Merr., and possibly the flowering stage of that species, although this is unlikely. It differs from that species in its much smaller leaves, and somewhat fewer nerves.

NAUCLEA MONOCEPHALA sp. nov.

Arbor parva capitulis exceptis glabra; foliis oblongo-ellipticis ad oblongo-ovatis, usque ad 25 cm longis, coriaceis, brevissime obtuseque acuminatis vel obtusis, basi rotundatis vel subacutis, nervis utrinque 8 ad 10; pedunculis solitariis, 5 cm longis, ad apicem bracteatis; capitulis in anthesi 6 cm diametro, calycis lobis pubescentibus, 7 mm longis, deciduis, floribus ebracteolatis.

A small tree, about 6 m in height, glabrous except the heads. Branches reddish-brown, terete, wrinkled when dry. Leaves coriaceous, oblong-elliptic to oblong-ovate, 17 to 25 cm long, 8 to 12 cm wide, or the uppermost pair only about 12 cm long,

brown when dry, slightly shining, the lower surface paler than the upper, the apex obtuse or very broadly and shortly blunt-acuminate, the base rounded or subacute, sometimes slightly inequilateral; lateral nerves 8 to 10 on each side of the midrib, prominent, anastomosing, the reticulations lax; petioles 1 to 2.5 cm long; stipules caducous, not seen. Heads terminal, solitary, their peduncles about 5 cm long, with distinct bract-scars near their apices, just before anthesis 3 cm in diameter, the close-packed projecting calyx-lobes yellowish, pubescent, heads in anthesis 6 cm in diameter. Flowers ebracteolate. Calyx-tube 3 mm long, the lower one-half nearly glabrous, the limb pubescent, irregularly lobed by the persistent, 1 to 2 mm long bases of the lobes, the lobes at anthesis very narrowly club-shaped, yellowish, rather densely pubescent above, about 7 mm long, deciduous. Corolla 12 to 14 mm long, glabrous, slightly widened upward, the lobes 5, oblong-ovate, rounded or obtuse, 2 mm long. Anthers included, 2 mm long. Style exserted; stigma ovoid.

LUZON, Province of Zambales, Botolan, *Merrill 2980*, June, 1903, specimens collected by S. Garcia.

In spite of its very differently shaped leaves probably as closely allied to *Nauclea reticulata* Havil., as to any other species. Another manifest ally is *N. jagori* Merr., which has very narrow leaves.

NAUCLEA VENOSA sp. nov.

Arbor circiter 5 m alta, inflorescentiis exceptis glabra; foliis usque ad 17 cm longis, crasse coriaceis, oblongo-ovatis, utrinque subconcoloribus nitidisque, breviter acuminatis, basi late rotundatis vel subcordatis, nervis utrinque circiter 16, valde prominentibus; pedunculis solitariis; capitulis (fructibus juvenilibus) 2.5 cm diametro, calycis lobis 5, lineari-spatulatis, pubescentibus, 2 ad 3 mm longis.

A tree about 5 m high, glabrous except the inflorescence. Branches reddish-brown, the younger ones strongly compressed. Leaves oblong-ovate or broadly oblong-ovate, thickly coriaceous, 10 to 17 cm long, 5 to 8 cm wide, sometimes somewhat falcate, the apex distinctly and sharply acuminate, the base broadly rounded or slightly cordate, brownish and shining on both surfaces when dry; lateral nerves about 16 on each side of the midrib, very prominent, the reticulations subparallel, slender, distinct; petioles 2.5 to 3 cm long; stipules not seen. Peduncles solitary, stout, 1.5 to 2.5 cm long, apparently bracteate at about the middle, judging by the scars (bracts not seen). Heads globose, in young fruit 2.5 cm in diameter, very dense, the flowers ebracteolate. Calyx free, the tube glabrous, 5 to 6 mm long, the

apex pubescent, as are the linear-spatulate or slenderly club-shaped, 2 to 3 mm long lobes. Corolla about 10 mm long, glabrous, the lobes 5, narrowly oblong, obtuse, about 3 mm in length.

MINDANAO, District of Zamboanga, Port Banga, *For. Bur. 9183 Whitford & Hutchinson*, January, 1908.

A strongly marked species, distinguishable by its very thickly coriaceous, prominently veined, oblong-ovate leaves.

OLDENLANDIA Linnaeus

OLDENLANDIA OVATIFOLIA (Cav.) DC. Prodr. 4 (1830) 427.

Hedyotis ovatifolia Cav. Ic. 6 (1801) 52, *t. 753*.
Oldenlandia nudicaulis Roth Nov. Pl. Sp. (1821) 95; Hook. f. Fl. Brit. Ind. 3 (1880) 70.

The oldest valid name for this species is here accepted. The species is represented by the following Philippine material: LUZON, Province of Bataan, Lamao River, *Merrill 3303*, *Williams 65*, *124*: Province of Laguna, Los Baños, *Hallier s. n.*

India to the Malay Peninsula and Java.

OPHIORRHIZA Linnaeus

OPHIORRHIZA UNDULATA sp. nov.

Planta erecta, simplex vel leviter ramosa, circiter 15 cm alta, caulibus brunneo-pubescentibus; foliis lanceolatis, acuminatis, margine undulatis, usque ad 9 cm longis, subtus pallidis; floribus paucis, ebracteolatis, circiter 4.5 mm longis; capsulis 4 mm longis, 8 mm latis.

An erect, simple or slightly branched herbaceous plant about 15 cm high, the stems slender, distinctly pubescent with short, more or less curled, brownish hairs. Leaves lanceolate, about equally narrowed at both ends, acuminate, base acute or acuminate, those of each pair very unequal in size, the larger ones 3 to 9 cm long, 0.7 to 1.7 cm wide, their petioles about 1 cm long, the smaller ones 1.5 to 3.5 cm long, 4 to 8 mm wide, subsessile or shortly petioled, margins undulate, the upper surface dark-olivaceous when dry, the lower pale-green or somewhat whitish. Flowers terminal, few, white, ebracteolate, their pedicels about 1 mm long. Calyx ovoid, 1.5 mm long, the teeth 5, linear-lanceolate, 0.8 mm long. Corolla white, tubular, the tube about 3 mm long, slightly enlarged at the base; lobes oblong, obtuse, 1.5 mm long. Filaments 2 mm long, slender; anthers oblong. Capsule compressed, about 4 mm long, 8 mm wide.

MINDANAO, District of Davao, Mount Binutun, *Weber 1445*, October 26, 1911, on banks of small streams in bamboo forests.

A species well characterized by its narrow, undulate, lanceolate leaves and small flowers. In vegetative characters quite different from our other Philippine species.

MUSSAENDA Linnaeus

MUSSAENDA CHLORANTHA sp. nov.

Arbor 6 ad 8 m alta, omnibus partibus plus minusve adpresse-hirsutis; foliis chartaceis vel subcoriaceis, late ovatis, breviter acuminatis, 12 ad 16 cm longis, nervis utrinque circiter 12; inflorescentiis terminalibus, hirsutis, corymbosis, multifloris; calycis segmentis lanceolatis, acuminatis, 1 cm longis, uno petiolato, late ovato, albo, 6 ad 7 cm longo; corolla extus hirsuta, tubo viride, lobis flavis.

A tree 6 to 8 m high. Branches somewhat compressed, reddish-brown, lenticellate, glabrous, the younger ones prominently appressed-hirsute with brownish hairs. Leaves in equal pairs, broadly ovate, chartaceous or subcoriaceous, 12 to 16 cm long, the upper surface glabrous or sparingly hirsute, the lower surface appressed-hirsute on the midrib and lateral nerves, apex shortly acuminate, base broad, rounded or somewhat decurrent; lateral nerves about 12 on each side of the midrib, distinct, curved upward; petioles hirsute, 1 to 4 cm long; stipules ovate to oblong-ovate, densely hirsute, about 1 cm long. Inflorescence terminal, corymbose, hirsute, densely many-flowered, 6 to 8 cm long and wide, the bracts and bracteoles oblong to oblong-lanceolate, 5 to 8 mm long. Calyx-tube about 6 mm long, densely hirsute, the lobes lanceolate, acuminate, about 1 cm long, the enlarged one petioled, white, its lamina broadly ovate, 6 to 8 cm long. Corolla-tube hirsute, green, nearly or quite 2 cm long, the lobes broadly ovate, yellow, spreading, about 7 mm long.

LUZON, Benguet Subprovince, Mount Tonglon, *Phil. Pl. 770 Merrill*, May, 1911, in forests, altitude about 1,800 m.

A species quite distinct from the common low-country *Mussaenda philippica* Rich., and probably most closely allied to *M. macrophylla* Wall., from which it seems to be sufficiently different to be described as a distinct species.

PAVETTA Linnaeus

PAVETTA BRACHYANTHA sp. nov.

Frutex vel arbor parva 3 ad 5 m altus, partibus junioribus inflorescentiisque pubescentibus; foliis chartaceis, oblongo-ellipticis vel oblongo-lanceolatis, utrinque acuminatis, nitidis, 6 ad 12 cm longis, in siccitate nigricantibus; corymbis multifloris, pubescentibus, bracteis late ovato-orbicularibus, acuminatis, bracteolis fimbriatis; floribus albis, circiter 9 mm longis.

An erect shrub or small tree 3 to 5 m high. Branches reddish- or somewhat grayish-brown, smooth and shining, the branchlets slightly pubescent. Leaves oblong-elliptic to oblong-lanceolate, gradually narrowed at both ends and slender acuminate, straight or slightly falcate, 6 to 12 cm long, 1.5 to 3.5 cm wide, shining, turning quite black in drying, the upper surface glabrous, the lower one slightly pubescent along the midrib and lateral nerves; nerves slender, about 8 on each side of the midrib; petioles 1 to 1.5 cm long, slightly pubescent; stipules up to 5 mm in length, apiculate-acuminate. Inflorescence terminal, corymbose, many-flowered, short-peduncled, 3 to 5 cm long, about as wide as long, distinctly pubescent; bracts suborbicular-ovate, 5 to 7 mm long, apiculate, the bracteoles deciduous, 2 to 4 mm long, fimbriate. Flowers 4-merous, white, fragrant. Calyx urceolate or narrowly campanulate, pubescent, about 3 mm long, the teeth oblong, acuminate, about 1 mm long. Corolla-tube 7 mm long, inner surface and throat villous, the lobes narrowly oblong, twisted, spreading, about 7 mm long and 2 mm wide. Anthers linear, 5 mm long. Style long-exserted, about 2 cm long. Fruit ovoid or subglobose, black when dry, about 6 mm in diameter.

LUZON, Benguet Subprovince, Baguio, *Williams 1177* (type), June, 1904, *1443*, November, 1904; Mount Tonglon, *Phil. Pl. 775 Merrill*, May, 1911.

A very distinct species well characterized by its short flowers. It has much the appearance of *Pavetta indica* L., so far as vegetative characters are concerned, but is not at all closely allied to that species; it is suggestive of *Pavetta involucrata* Thw., of Ceylon, but is very different from that species.

PLECTRONIA Linnaeus

PLECTRONIA MONSTROSA A. Rich. Mém. Rub. (1830) 109; Mém. Soc. Hist. Nat. Paris 5 (1834) 189.

Canthium mite Bartl. ex DC. Prodr. 4 (1830) 474; Miq. Fl. Ind. Bat. 2 (1856) 252; F.–Vill. Novis. App. (1880) 110.
Ronabea bipinnata Blanco Fl. Filip. (1837) 162.
Ronabea arborea Blanco l. c. ed. 2 (1845) 114.
Canthium arboreum Vid. Phan. Cuming. Philip. (1885) 119, 181.
Canthium bipinnatum Merr. in Govt. Lab. Publ. (Philip.) 27 (1905) 53.
Plectronia mitis Elm. Leafl. Philip. Bot. 1 (1906) 28, 360.

This species is common and widely distributed in Luzon. There are at present 21 specimens in the Herbarium of the Bureau of Science, all from that Island, the Provinces of Isabela, Abra, Bontoc, Benguet, Ilocos Sur, Union, Pangasinan, Zambales, Pampanga, Rizal, Bataan, Laguna, and Batangas, being represented.

While the dates of publication of *Plectronia monstrosa* A. Rich., and *Canthium mite* Bartl., are undoubtedly close, still it is a clear case of

priority for the former. Richard's paper on the *Rubiaceae* was read in July, 1829, which is the date on the title page, but the preface is dated December 1, 1830, hence the inference is that it was not published before 1830. *Plectronia monstrosa* A. Rich., is not given by DeCandolle in his monograph, which was also issued in 1830. However, *Canthium lycioides*, published by Richard on the preceding page of the same publication, is included by DeCandolle in his monograph,[4] with proper page reference to the original publication of Richard's paper, hence it is evident that Richard's publication antedates DeCandolle's.

Doctor C. B. Robinson has examined the type of *Plectronia monstrosa* A. Rich., which is preserved in the Herbarium of the Paris Museum of Natural History. He has supplied me with notes regarding it, and with carbon "leaf-rubbings," from which data, and the description, the identity of the species is clear. Doctor Robinson states that there are two sheets of the type collection (*Perrottet*), as well as three sheets of *Gaudichaud 206*, from the Philippines, and a specimen of *Cuming 776* in the Paris Herbarium, and that *Cuming 776* represents the species well, except that in Perrottet's specimens there are abnormal outgrowths at the base of each of the two branches. I have personally examined the type of *Canthium mite* Bartl., in the Prague Herbarium, and am convinced that *Plectronia monstrosa* A. Rich., *Canthium mite* Bartl., and *C. arboreum* Vid., are all the same species. The chief difference between the types of the first two is in leaf-size, the former having smaller leaves than the latter, but in shape, texture, venation, etc., as well as in other characters, they are quite the same.

PLECTRONIA LEYTENSIS sp. nov.

Species P. viridi ut videtur affinis, differt foliis minoribus angustioribus et venis obscuris.

A shrub or small tree 10 m high *fide* Ramos, glabrous. Branches slender, terete, smooth, yellowish-brown. Leaves lanceolate, coriaceous, 3 to 7 cm long, 1 to 2 cm wide, the upper surface shining when dry, the lower of about the same color but dull, some of the vein-axils, at least, glandular, base somewhat decurrent-acuminate, apex slenderly subcaudate-acuminate, the acumen more or less falcate; lateral veins about 5 on each side of the midrib, slender, obscure, scarcely anastomosing, the reticulations obsolete; petioles about 5 mm long; stipules 3 mm long, narrow, acuminate. Flowers unknown. Fruit axillary, usually solitary, rarely two in each axil, pedicelled, narrowly obovoid, 1 cm long, the apex rounded, the base acute, more or less narrowed to the 5 mm long pedicel. Pericarp somewhat fleshy when fresh, yellow, not or but very little compressed.

LEYTE, mountains back of Dagami, *Bur. Sci. 15383 Ramos*, August, 1912, in the mossy forest.

[4] Prodr. 4 (1830) 475.

A species manifestly allied *to Plectronia viridis* Merr., and very similar to it. The leaves, however, are smaller, quite different in shape, and the venation is decidedly different.

PLECTRONIA FENICIS sp. nov.

Species ut videtur P. monstrosae valde affinis, differt venis magis numerosis, utrinque circiter 8, fructibus multo majoribus, usque ad 2.5 cm longis.

A glabrous tree 8 to 10 m high, the ultimate branches somewhat compressed, brownish-olivaceous. Leaves oblong-ovate, subcoriaceous, brittle when dry, somewhat shining, 10 to 15 cm long, 4 to 8 cm wide, apex shortly acuminate, base somewhat decurrent-acuminate; petioles about 1 cm long; stipules caducous, about 5 mm long; nerves about 8 on each side of the midrib, distinct, faintly anastomosing, the reticulations indistinct, lax. Flowers unknown, but the inflorescence apparently similar to that of *Plectronia monstrosa* A. Rich (*Canthium arboreum* Vid., *Canthium mite* Bartl.). Fruit ellipsoid to obovoid, wrinkled when dry, brown-olivaceous, 2 to 2.5 cm long, 1.5 to 2 cm in diameter.

LUZON, Province of Benguet, Sablan, *Bur. Sci. 12693 Fénix* (type), November 23, 1910, growing on slopes. A rather incomplete specimen from Danao, Cebu, *For. Bur. 6424 Espinosa*, may also be referable here.

A species manifestly allied to *Plectronia monstrosa* A. Rich., but at once distinguished by its larger fruits, and its more numerous veins. In *Plectronia monstrosa* the fruits are 1 cm long or less, while the leaves usually have but 5 or 6 pairs of veins.

PLECTRONIA PEDUNCULARIS (Cav.) Elm. Leafl. Philip. Bot. 1 (1906) 28, 360.

Canthium pedunculare Cav. Ic. 5 (1799) 21, *t. 436;* Blanco Fl. Filip. ed. 2 (1845) 116; Miq. Fl. Ind. Bat. 2 (1856) 256; Vid. Sinopsis Atlas (1883) *t. 57, f. H.*

Canthium monoflorum Blanco Fl. Filip. (1837) 166.

Canthium lycioides A. Rich. Mém. Rub. (1830) 108, Mém. Soc. Hist. Nat. Paris 5 (1834) 188; DC. Prodr. 4 (1830) 475; F.-Vill. Novis. App. (1880) 110.

Plectronia lycioides Elm. l. c. 28, 360.

LUZON, Manila and vicinity, *Bur. Sci. 12207 Ramos*, September, 1910, *Manotoc 91;* Province of Bulacan, Malinta, *Bur. Sci. 6122 Robinson & Merritt:* Province of Bataan, Lamao River, *Merrill 2545, For. Bur. 1221 Borden, Whitford 401, Williams 78.* PALAWAN, *For. Bur. 3610 Curran, Bur. Sci. 818 Foxworthy.*

This species is common in dry thickets near Manila, and in the provinces contiguous to the city; it does not appear, however, to be of common distribution in the Philippines.

The original description of *Canthium lycioides* A. Rich. is short, but I

had determined it to be the same as *Plectronia peduncularis* (Cav.) Elm. In order to verify the matter Doctor C. B. Robinson kindly examined the type in the herbarium of the Paris Museum of Natural History, and informs me that it is undoubtedly the same species as *Cuming 1406* and *1437*, both of which unquestionably are referable to Cavanilles' species.

PLECTRONIA PAUCINERVIA sp. nov.

Frutex glaber 3 ad 4 m altus, ramulis junioribus plus minusve resinosis; foliis oblongis vel oblongo-ellipticis, coriaceis, utrinque acuminatis, usque ad 16 cm longis, in siccitate supra nitidis, brunneis, subtus pallidioribus; nervis utrinque 5, prominentibus, reticulis laxissimis vel obsoletis; fructibus aurantiacis, obovoideis, circiter 7 mm longis, umbellatis; umbellis axillaribus, solitariis, brevissime pedunculatis vel subsessilibus.

A glabrous shrub 3 to 4 m high. Branches terete, dark-colored and smooth when dry, the younger parts and the buds more or less resinous, shining, nearly black. Leaves oblong, coriaceous, 14 to 16 cm long, 5 to 6 cm wide, subequally narrowed and acuminate at both ends, the upper surface very smooth and shining, dark-brown when dry, the lower surface dull or very slightly shining, yellowish-brown or pale-brown when dry; nerves 5 on each side of the midrib, distant, curved-ascending, scarcely or very faintly anastomosing, the reticulations very lax, often entirely obsolete; petioles 1.5 to 2 cm long; stipules triangular-ovate, slenderly acuminate, about 5 mm long. Flowers not seen. Fruits obovoid, about 7 mm long, in axillary, solitary, short-peduncled or subsessile umbels, about 5 in each umbel, their pedicels about 8 mm long, the common peduncle stout, about 2 mm long.

MINDANAO, District of Zamboanga, Sax River Mountains back of San Ramon, *Merrill 8263*, November 29, 1911, in damp forests, altitude about 900 m.

A species well characterized by its short-peduncled, solitary, umbellate inflorescence, and by its leaves with few nerves and practically obsolete reticulations.

PSYCHOTRIA Linnaeus

PSYCHOTRIA CAGAYANENSIS sp. nov.

Arbor parva, circiter 5 m alta, inflorescentiis obscure parce pubescentibus exceptis glabra; foliis chartaceis, lanceolatis, utrinque acuminatis, in siccitate plus minusve pallidis nitidisque, usque ad 16 cm longis, nervis utrinque circiter 13, anastomosantibus; paniculis terminalibus, sub fructu circiter 6 cm longis, pyramidatis; fructibus obovoideis, circiter 8 mm longis, seminibus dorso convexo vix sulcato.

A small tree about 5 m in height, glabrous throughout except the slightly and obscurely pubescent panicles. Branches light-reddish-brown, or somewhat grayish, terete, slightly striate when dry. Leaves lanceolate to rather broadly lanceolate, chartaceous, 10 to 16 cm long, 2.4 to 4.5 cm wide, rather pale and somewhat shining when dry, of about the same color on both surfaces, gradually narrowed and acuminate at both ends, the apex sharply acuminate; nerves about 13 on each side of the midrib, nearly straight, somewhat ascending, anastomosing and forming a rather faint, looped, submarginal nerve, obscure above, rather distinct on the lower surface, the reticulations rather lax; petioles 1 to 1.4 cm long; stipules very short, truncate. Panicles terminal, subpyramidal, rather lax, in fruit about 6 cm long, shortly pedunculed, the lower branches spreading, 2.5 cm long, obscurely pubescent. Flowers unknown. Fruits obovoid, about 8 mm long, 5.5 to 7 mm in diameter, apex rounded, base gradually narrowed, the pericarp when dry not ridged, or very faintly so, the seeds plano-convex, not at all ridged or sulcate.

LUZON, Province of Cagayan, Casambalangan, *For. Bur. 15491 Bernardo*, April, 1910, in forests at an altitude of about 10 m, locally known as *tutulang*.

A species somewhat resembling *Psychotria pinnatinervia* Elm., but distinguishable at once by its plano-convex, not ridged or grooved seeds, and not closely allied to that species. It is probably more closely allied to *P. luçoniensis* F.-Vill., but is quite different from that species.

PSYCHOTRIA GRACILIPES sp. nov.

Frutex erectus, glaber, circiter 2.5 m altus; floribus chartaceis vel subcoriaceis, oblongo-ellipticis, utrinque angustatis, breviter acuminatis, usque ad 9 cm longis, nervis utrinque 10 ad 12, subrectis, patulis; petiolo 0.7 ad 1.5 cm longo; inflorescentiis terminalibus, depauperato-umbellatis, pedunculis gracilibus, circiter 5 mm longis; fructibus ellipsoideis, 5 ad 6 mm longis, leviter longitudinaliter sulcatis, pyrenis plano-convexis, 5 mm longis, ovoideis, acutis, obscure carinatis, 5-sulcatis.

An erect shrub about 2.5 m high, quite glabrous. Branches slender, terete, grayish-brown, the ultimate ones 1 to 1.5 mm in diameter. Leaves chartaceous or subcoriaceous, oblong-elliptic, subequally narrowed at both ends, 5 to 9 cm long, 1.5 to 2.5 cm wide, slightly shining, of about the same color on both surfaces when dry, apex shortly acuminate, base acute; nerves 10 to 12 on each side of the midrib, nearly straight, spreading at first, curved-anastomosing near the margins, the reticulations indistinct; petioles 7 to 15 mm long. Inflorescence terminal, or in the uppermost axils, umbellate, apparently few-flowered, the

peduncle slender, about 5 mm long. Flowers unknown. Fruit solitary to 3 or 4, umbellate, the pedicels slender, about 5 mm long, the fruit orange-red, ellipsoid, 5 to 6 mm long, when dry obscurely sulcate. Pyrenes ovoid, rounded at one end, acute at the other, plano-convex, about 5 mm long, 3.5 mm wide, dorsally slightly keeled, the lateral ridges obscure, shallowly 5-sulcate.

LUZON, Province of Cagayan, Abulug River, *Weber 1572*, February 5, 1912, on rocky hillsides, limestone formation, in forests, altitude not indicated.

A species probably as closely allied to *Psychotria longipedicellata* Elmer, as to any other species, differing in many characters, especially in being quite glabrous, not at all pubescent.

PSYCHOTRIA SARCOCARPA sp. nov.

Frutex scandens, usque ad 3 m altus, ramulis subtus foliis inflorescentiisque dense brunneo- vel ferrugineo-pilosis; foliis ellipticis vel ovalibus, chartaceis obtusis vel rotundatis, usque ad 4 cm longis, nervis utrinque circiter 7; inflorescentiis axillaribus terminalibusque, laxis, paucifloris, folia subaequantibus; fructibus ovoideis, succulentis, circiter 12 mm longis.

A scandent shrub, climbing along the trunks of trees, 3 m high or less. Branches slender, densely covered with usually dark-brown, more or less curled or crisped, pilose hairs. Leaves elliptic, chartaceous, 3 to 4 cm long, 1.5 to 2.5 cm wide, obtuse or rounded at both ends, the upper surface glabrous or nearly so, the lower surface brown-pilose, densely so on the midrib and nerves; lateral nerves 7 on each side of the midrib, distinct, somewhat ascending, reticulations lax, not prominent; petioles densely pubescent, 3 to 4 mm long. Inflorescence axillary and terminal, densely brown-pubescent, lax, few-flowered, usually shorter than the leaves, the pedicels 5 to 7 mm long. Calyx densely pubescent, 3 to 4 mm long, 5-toothed, the teeth oblong, obtuse. Corolla externally pubescent, white, 5 mm long, the lobes as long as the tube, narrowly oblong, obtuse, about 2.5 mm long. Anthers 1 mm long. Fruit, when fully mature, very soft and fleshy, white, about 12 mm long, ovoid or ellipsoid, sparingly pubescent with very scattered hairs, the pyrenes 8 mm long, narrowly oblong-elliptic, about 8 mm long, concavo-convex, dorsally longitudinally 2-ridged in the median part, subequally narrowed at both ends, acute or somewhat acuminate.

MINDANAO, District of Zamboanga, Sax River Mountains back of Zamboanga, *Merrill 8077*, November 27, 1911, in densely forested, damp, shaded ravines along small streams, altitude 650 to 1,000 m.

Probably most closely allied to *Psychotria ovalis* Elmer, but with smaller, fewer-nerved leaves and very different fruits.

PSYCHOTRIA WEBERI sp. nov.

Frutex glaber circiter 2 m altus; foliis coriaceis, oblongis vel oblongo-ellipticis, coriaceis, subtus pallidis, utrinque angustatis, apice acutis vel breviter acuminatis, nervis utrinque 15 ad 19, distinctis, curvatis, anastomosantibus, reticulis undulatis, subparallelis; petiolo 1.5 ad 3.5 cm longo; paniculis terminalibus, sessilibus vel pedunculatis, quam petioli brevioribus; floribus congestis, subsessilibus, fructibus junioribus ovoideis, vix sulcatis.

An erect glabrous shrub about 2 m high. Branches terete, olivaceous, the ultimate ones slightly compressed. Leaves coriaceous, oblong to oblong-elliptic, narrowed at both ends, the apex acute or shortly acuminate, base acute, 12 to 18 cm long, 4.5 to 6.5 cm wide, somewhat shining when dry, the lower surface much paler than the upper; nerves 15 to 19 on each side of the midrib, prominent, curved, anastomosing near the margin, the reticulations subparallel, undulate, not prominent; petioles 1.5 to 3.5 cm long. Panicles terminal, shorter than the petioles, sessile and branched from the base, or shortly peduncled. Flowers crowded at the ends of the few branches, sessile or shortly pedicelled, white. Calyx about 3 mm long, obscurely 5-toothed. Corolla 5.5 to 6 mm long, the tube about 2 mm in length, the lobes oblong-ovate, acute or somewhat acuminate, reflexed. Filaments slender, 1.5 mm long; anthers ovoid, about 1 mm long. Immature fruit ovoid, smooth, 5 to 6 mm long, not at all sulcate.

LUZON, Province of Cagayan, Abulug River, *Weber 1573*, January, 1912, on rocky hillsides, altitude about 30 m.

A species apparently similar to and closely allied to *Psychotria banahaensis* Elm., differing especially in its abbreviate inflorescence and more numerously nerved leaves.

PSYCHOTRIA MINDANAENSIS sp. nov.

Frutex 3 ad 5 m altus, inflorescentiis minutissime puberulis exceptis glaber; foliis lanceolatis vel anguste oblongo-lanceolatis, utrinque subaequaliter angustatis, acuminatis, subcoriaceis, nitidis, in siccitate plus minusve coloratis, nervis utrinque circiter 11, reticulis subobsoletis; inflorescentiis terminalibus, pedunculatis; fructibus ellipsoideis, carnosis, in siccitate circiter 9 mm longis, longitudinaliter sulcatis.

An erect glabrous shrub 3 to 5 m high, the leaves reddish or reddish-brown when dry. Branches terete, dark reddish-brown, smooth and shining. Leaves lanceolate or narrowly oblong-lanceolate, equally narrowed at both ends, rather slenderly and gradually acuminate, 10 to 15 cm long, 2 to 3 mm wide, sub-

coriaceous, shining; nerves 11 on each side of the midrib, distant, obscurely anastomosing, the reticulations obsolete or nearly so; petioles about 1.5 cm long; stipules somewhat sheathing, reddish-brown, about 1 cm long. Inflorescence terminal, peduncled, in flower about 5 cm long, very minutely puberulent, the flowers subumbellately arranged on the ultimate branchlets. Pedicel and calyx continuous, narrowly funnel-shaped, about 3 mm long, minutely 5-toothed. Corolla, in nearly mature bud, externally very slightly puberulent, 2.2 mm long, the tube 1 mm long, the lobes oblong-ovate, acute. Anthers 1.3 mm long. Fruit ovoid, fleshy and red when fresh, when dry longitudinally 6-sulcate, 8 to 10 mm long. Pyrenes plano-convex, longitudinally and prominently 3-sulcate on the back, about 8 mm long, 5 mm wide, elliptic-oblong. Seeds 6-ridged, sulcate on the back.

MINDANAO, District of Zamboanga, Sax River Mountains back of San Ramon, *Merrill 8084, 8096* (type), November 17, 1911, in forests, altitude 800 to 900 m.

A species well characterized by its narrow leaves which are reddish-brown when dry, with distant nerves and obsolete or nearly obsolete reticulations. It does not appear to be very closely allied to other Philippine forms.

PSYCHOTRIA EUPHLEBIA sp. nov.

Frutex 1 ad 2 m altus, glaber, vel partibus junioribus plus minusve ferrugineo-pubescentibus; foliis oblongis, chartaceis, 15 ad 25 cm longis, nitidis, in siccitate brunneis, utrinque subaequaliter angustatis, basi acutis, apice breviter acuminatis, nervis utrinque 17 ad 25; inflorescentiis terminalibus, congestis, quam petioli brevioribus, paucifloris; fructibus ovoideis, 8 mm longis, seminibus plano-convexis, vix sulcatis.

A shrub 1 to 2 m high, quite glabrous, or the growing parts and petioles of the younger leaves ferruginous-pubescent. Branches terete, brownish. Leaves oblong, chartaceous, rarely subcoriaceous, oblong, subequally narrowed at both ends, the base acute, the apex shortly acuminate, 15 to 25 cm long, 2.5 to 5 cm wide, somewhat shining, brownish when dry, the midrib very prominent; lateral nerves 18 to 25 on each side of the midrib, prominent, somewhat curved, anastomosing, the reticulations lax, not prominent; petioles 1 to 2 cm long; stipules oblong-ovate, acuminate, about 5 mm long, deciduous. Inflorescence terminal, short, dense, more or less pubescent, becoming glabrous or nearly so. Flowers unknown. Infrutescence dense, 1.5 cm long or less, the fruits reddish-yellow when fresh, becoming brown or black when dry, ovoid, about 8 mm long, smooth, not

at all sulcate, the seeds plano-convex, ruminate, not at all sulcate or ridged on the back.

LUZON, Province of Cagayan, Abulug River, *Bur. Sci. 14582* (type), *13928 Ramos, For. Bur. 19638 Curran*, January, 1912, in forests.

A species manifestly allied to *Psychotria tayabensis* Elm., differing especially in its larger, more numerously nerved leaves.

PSYCHOTRIA ALVAREZII sp. nov.

Species P. bataanensi Elm. valde affinis, differt foliis majoribus, usque ad 15 cm longis, basi late rotundato-cordatis, nervis utrinque circiter 25, fructibus obovoideis, conspicue 8-alatis.

A shrub or small tree, somewhat pubescent, or nearly glabrous, the leaves reddish-brown when dry. Branches terete, dark-grayish. Leaves oblong to oblong-ovate, coriaceous, 12 to 15 cm long, 4 to 7 cm wide, somewhat narrowed to the rather broadly rounded-cordate base, more narrowed towards the obtuse or rounded apex, the upper surface smooth, glabrous, shining, the lower often slightly pubescent, reddish-brown, the lateral nerves very prominent, 18 to 25 or more on each side of the midrib, slightly curved, anastomosing, the reticulations distinct; petioles 1 to 2 cm long, usually somewhat pubescent; stipules early deciduous, not seen. Flowers not seen. Infrutescence terminal, simple and unbranched or with three branches from the base, the branches or peduncles 1.5 cm long or less, the fruits capitately arranged, few to many, forming subglobose heads, the individual fruits obovoid, shortly pedicelled, about 7 mm long, longitudinally 8-winged, the wing-like ridges rather thin, 1 to 1.5 mm wide. Seeds plano-convex, ruminate, not longitudinally ridged or sulcate on the back.

LUZON, Province of Nueva Ecija, *For. Bur. 22189 Alvarez*, December, 1910.

A species manifestly allied to *Psychotria bataanensis* Elmer, but with larger, more numerously nerved, differently shaped leaves, and its fruits with the longitudinal ridges developed into 8 narrow wings. In *Psychotria bataanensis* the fruits are sulcate or ridged, but in no degree approach the fruits of the present species in this respect.

PSYCHOTRIA RIZALENSIS sp. nov.

Species P. bataanensi Elm. valde affinis et similis, differt foliis basi acutis vel subrotundatis, vix anguste cordatulis.

A shrub or small tree, the branchlets, petioles, younger leaves on the midrib and lateral nerves beneath pubescent with dark-brown hairs, the branches terete, brownish, glabrous. Leaves oblong to oblong-elliptic, coriaceous, 8 to 10 cm long, 2 to 4 cm wide, the upper surface smooth and shining, quite glabrous, the lower somewhat paler, the lateral nerves very prom-

inent, anastomosing, parallel, somewhat curved, the reticulations not prominent, the apex acute, the base acute or somewhat rounded, not at all cordate, often a little inequilateral; petioles 8 to 10 mm long; stipules oblong-ovate, black and shining when dry, glabrous, or the basal part brown-pubescent, deciduous. Inflorescence terminal, pubescent, of a single simple peduncle, or 3-branched at the base, the peduncle or the branches 1 cm long or less, brown-pubescent. Young flowers apparently sessile, in dense, globose heads about 5 mm in diameter. Fruits congested, 5 or more at the end of each branch or peduncle, sessile or subsessile, obovoid, about 7 mm long, brown, crowned by the persistent calyx-tube, shallowly longitudinally 8-ridged.

LUZON, Province of Rizal, Montalban, *Loher 6345*, July, 1905.

It is possible that *Loher 6405*, from the same locality, should be referred here, but this specimen has thinner leaves which turn brown or reddish-brown in drying. The species is manifestly very closely allied to *Psychotria bataanensis* Elm., from which it differs chiefly in its leaves being gradually narrowed to the acute or somewhat rounded base, not at all cordate.

RANDIA Linnaeus

RANDIA LANCEOLATA sp. nov.

Frutex partibus junioribus inflorescentiisque puberulis exceptis glaber; foliis lanceolatis vel anguste lanceolatis, coriaceis, nitidis, usque ad 10 cm longis, 5 ad 10 mm latis, rectis vel falcatis, supra sensim angustatis, acuminatis, basi angustatis. acutis vel cuneatis; pedunculis axillaribus, soiltariis, 1-floris, supra bibracteatis, tenuibus, 1.5 ad 2 cm longis; fructibus anguste oblongo-ovoideis, 1 cm longis, utrinque angustatis.

A shrub, quite glabrous except for the somewhat puberulent younger parts and inflorescence, the branches and leaves rather crowded, the ultimate branches slender, terete or somewhat compressed, usually dark-colored when dry, or reddish-brown. Leaves numerous, lanceolate to narrowly lanceolate, straight or falcate, coriaceous, of about the same color on both surfaces when dry, the upper surface shining, the lower dull, 5 to 10 cm long, 5 to 10 mm wide, gradually narrowed upward to the slender acuminate apex, the base narrowed, acute or cuneate; nerves about 10 on each side of the midrib, very obscure; petioles about 3 mm long, glabrous or slightly pubescent; stipules lanceolate, about 5 mm long. Flowers axillary, long-pedicelled, the pedicels usually solitary, puberulent, 1.5 to 2 cm long, slender, with a pair of oblong, acute, 2 mm long bracteoles near the apex. Calyx at about time of anthesis narrowly urceolate, about 4 mm long, 5-toothed, somewhat pubescent or puberulent, the teeth

ovate, acute, 1 to 1.5 mm long. Corolla not seen. Fruit narrowly oblong-ovoid, 1 cm long, about 4 mm wide in the middle, narrowed at both ends, base acute, apex crowned by the persistent calyx-lobes, 2-celled. Seeds numerous, narrowly oblong, irregular, more or less flattened, 3 to 4 mm long.

LUZON, Province of Cagayan, Abulug River, near Tauit, *For. Bur. 11626 Fischer*, February, 1912, on sandstone cliffs along the river, apparently in situations subject to overflow during times of high water, altitude about 30 m.

A species similar to *Randia stenophylla* Merr., but differing in being nearly glabrous, with shining leaves, and with very different fruits.

TETRALOPHA Hooker filius

TETRALOPHA? NIGRA sp. nov.

Frutex scandens, glaber, ramis ramulisque in siccitate pallidis, vix lenticellatis; foliis oblongis, coriaceis, acuminatis, usque ad 20 cm longis, in siccitate utrinque nigris nitidisque, nervis utrinque circiter 10, anastomosantibus; floribus ignotis; fructibus depresso-globosis, nigris, 0.8 ad 1.5 cm diametro, normaliter 4-locellatis, abortu 1- ad 3-locellatis, pericarpio coriaceo.

A scandent shrub, quite glabrous. Branches terete, wrinkled and light-gray when dry, not at all lenticellate, the branches up to 8 mm in diameter, the branchlets slender. Leaves oblong, coriaceous, uniformly black and shining on both surfaces when dry, 11 to 20 cm long, 3 to 7 cm wide, subequally narrowed to the acute base and to the shortly acuminate apex; lateral nerves 10 on each side of the midrib, distinct, anastomosing, the reticulations lax; petioles 1.5 to 2 cm long; stipules not seen, apparently broad, deciduous. Flowers unknown. Fruiting racemes axillary, solitary or fascicled, 2 to 4 cm long, with short, broad, stipule-like bracts at the nodes, the pedicels 3 mm long or less. Fruit black when dry, globose or depressed-globose, shining, normally 4-celled, 4-seeded, often by abortion 1 to 3-celled and seeded, when 1-celled about 8 mm in diameter, when 3- or 4-celled 1.2 to 1.5 cm in diameter, the pericarp coriaceous, very slightly sulcate between the cells. Seeds 1 in each cell, black, in general obovate-oblong, irregular, more or less compressed and angled, about 6 mm long.

MINDANAO, Butuan Subprovince, near Butuan, *Bur. Sci. 15877 Fénix*, August 30, 1912.

There is no more reason for placing this species in *Tetralopha* than in *Gynochthodes*, but as the remaining manifestly allied Philippine forms have been described in the former genus, the present form is so referred. In the absence of flowers it is difficult to determine to which genus it properly belongs. *Tetralopha nigra* differs from the three forms pre-

viously described from the Philippines in its larger, more numerously nerved leaves. Its alliance is with *T. philippinensis* Elm. and *T. polillensis* C. B. Rob. The uniformly black and prominently shining leaves (when dry) is characteristic.

TIMONIUS De Candolle

TIMONIUS LONGISTIPULUS sp. nov.

Frutex ut videtur scandens epiphyticus, partibus junioribus nodisque plus minusve ciliatis; foliis lanceolatis, coriaceis, nitidis, usque ad 10 cm longis, valde caudato-acuminatis, basi acutis, petiolatis, nervis utrinque 4 vel 5, distinctis, reticulis obsoletis; stipulis lanceolatis, 1.5 ad 2 cm longis, caducis; floribus axillaribus, solitariis, pedicellatis; fructibus adpresse pubescentibus, calycis lobis persistentibus, longe acuminatis.

Apparently an epiphytic more or less scandent shrub. Branches dark reddish-brown, terete, wrinkled when dry, slender, glabrous, the branchlets sometimes ferruginous-ciliate, their nodes prominently ciliate with long ferruginous hairs, the petiolar scars prominent. Leaves 5 to 10 cm long, 1.5 to 2 cm wide, lanceolate, coriaceous, brown and shining on both surfaces when dry, the lower surface a little paler than the upper, more or less ciliate with long, appressed or spreading hairs on the nerves of the lower surface, in younger leaves also somewhat ciliate on the margins and upper surface, the base acute, the apex long and slenderly caudate-acuminate; lateral nerves 4 or 5 on each side of the midrib, slender but distinct on both surfaces, ascending, the reticulations obsolete; petioles 4 to 8 mm long; stipules lanceolate, deciduous, brown, submembranaceous, glabrous, 1.5 to 2 cm long, 4 mm wide, long and slenderly caudate-acuminate. Flowers solitary, axillary, the pedicels in fruit about 1 cm long, with two large bracteoles at the apex subtending the fruit, these bracteoles ovate-lanceolate to oblong-ovate, acuminate, 5 to 6 mm long. Fruit depressed-globose, about 6 mm in diameter, appressed-pubescent, when dry more or less rugose, the persistent calyx 6 mm long, its tube about 2 mm long and 2 mm thick, cylindric, the 4 lobes recurved or spreading, lanceolate, long and slenderly acuminate, 4 mm long. Pyrenes about 15, narrowly oblong-obovate, rounded at their apices, about 4 mm long.

LEYTE, *Bur. Sci. 15371 Ramos,* August 13, 1912, on trees in the mossy forest, mountains back of Dagami, the fruit green.

A very characteristic species, manifestly allied to *Timonius epiphyticus* Elm., but still very different from that species. Prominent distinguishing characters are its very long stipules, its elongate and persistent calyx, and the prominent bracteoles subtending the fruit.

TIMONIUS GRACILIPES sp. nov.

Frutex circiter 2 m altus, partibus junioribus plus minusve ciliato-hirsutis; foliis parvis, subtus pallidioribus, ad costa nervosque leviter adpresse hirsutis, oblongis vel oblongo-ovatis, usque ad 3.5 cm longis, acuminatis; floribus axillaribus, solitariis, longe tenuiter pedicellatis, bracteolis aciculatis, ovario 6-locellato.

A shrub about 2 m high, the branches terete, gray or reddish-brown, stiff, glabrous, the branchlets numerous, marked with numerous, close-set petiolar scars, the younger parts rather prominently ciliate-hirsute, the hairs pale-brownish. Leaves opposite, small, subcoriaceous, oblong to oblong-ovate, 2.5 to 3.5 cm long, 5 to 12 mm wide, pale when dry, the upper surface glabrous or only very sparingly pubescent, the lower surface paler than the upper one, distinctly appressed-hirsute along the midrib and the lateral nerves, the apex distinctly acuminate, the base acute or obtuse, the margins plane or very slightly recurved; lateral nerves 5 or 6 on each side of the midrib, ascending, straight, the ultimate reticulations netted, rather close; petioles ciliate-hirsute, 3 mm long or less; stipules lanceolate, as long as the petioles, ferruginous-hirsute, deciduous. Flowers in the upper axils, solitary, long-pedicelled, the pedicels slender, sparingly hirsute, at anthesis 1 to 1.5 cm long, increasing in length and 2 cm long in fruit, with two acicular, 2 to 2.5 mm long bracteoles at the apex immediately below the flower. Calyx-tube about 2 mm long, the teeth 4, slightly pubescent, linear, as long as the tube. Corolla about 2 mm long. Ovary about 6-celled; style 4-cleft. Fruit ellipsoid, about 4 mm long, slightly hirsute.

CEBU, Buacao, in thickets on dry hills, *Bur. Sci. 11110 Ramos*, March, 1912.

A very distinct species, characterized by its small leaves and its solitary, long- and slenderly pedicelled flowers.

UNCARIA Schreber

UNCARIA PERROTTETII (A. Rich.) comb. nov.

Sabicea perrottetii A. Rich. in Mém. Rub. (1830) 148; Mém. Soc. Hist. Nat. Paris 5 (1834) 228.
Ouroupartia perrottetii Baill. in Bull. Soc. Linn. Paris 1 (1879) 227.
Uncaria ferrea F.-Vill. Novis. App. (1880) 105, non DC.
Uncaria hookeri Vid. Phan. Cuming. Philip. (1885) 118, 177, Rev. Pl. Vasc. Filip. (1886) 149; Havil. in Journ. Linn. Soc. Bot. 33 (1897) 86, *pl. 4, f. 13–18;* Elm. Leafl. Philip. Bot. 1 (1906) 37.

LUZON, without definite locality, *Cuming 1128* (cotype of *Uncaria hookeri* Vid.), *Loher 6321:* Province of Ilocos Norte, Mount Piao, *For. Bur. 12481 Merritt & Darling*, November, 1908: Province of Pampanga, Mount Abu,

Bur. Sci. 1970 Foxworthy, January, 1907: Province of Bulacan, Norzagaray, *Yoder 246*, December, 1906: Province of Rizal, Montalban, *Loher s. n.*; Bosoboso, *Merrill 1830*, April, 1903, *For. Bur. 1890 Ahern's collector*, October, 1904, *Bur. Sci. 2127 Ramos*, February, 1907: Province of Bataan, Dinalupijan, *Merrill 1586*, January, 1903: Province of Laguna, Calauan, *Phil. Pl. 458 McGregor*, December, 1910; Los Baños, *Hallier s. n.*, December, 1903.

Borneo, fide Haviland.

The earliest specific name is here taken up in accordance with the Vienna Code. The original description of the species is very short, and is inadequate as a means of determining the species. DeCandolle[5] simply cites the name with the comment "videtur Uncariae sp." The type of *Sabicea perrottetii* A. Rich. is preserved in the Herbarium of the Paris Museum of Natural History, and probably was examined by Haviland, for he correctly places the species, although using a later specific name. Doctor C. B. Robinson who recently kindly looked up the type at my request, states that *Sabicea perrottetii* is the same as *Uncaria hookeri* Vid., and that a specimen collected in Luzon by Barthe, also preserved in the Paris Herbarium, is so named in Haviland's handwriting.

UROPHYLLUM Wallich

UROPHYLLUM GRANDISTIPULUM sp. nov.

Frutex glaber vel subglaber, foliis subcoriaceis, usque ad 20 cm longis, oblongis, acuminatis, nervis prominentibus, utrinque circiter 15; stipulis magnis, subchartaceis, 3 ad 4 cm longis, oblongis vel oblongo-ovatis; floribus axillaribus, ut videtur simpliciter umbellatis vel fasciculatis, fructibus ovoideis, carnosis, circiter 2 cm diametro.

A glabrous shrub about 8 m in height *fide* Ramos. Branches terete, the younger ones compressed, glabrous. Leaves oblong, subcoriaceous, 12 to 20 cm long, 3.5 to 6 cm wide, of the same color and uniformly shining on both surfaces when dry, the base acute or somewhat decurrent, the apex rather slenderly long acuminate, nerves about 15 on each side of the midrib, prominent, curved, anastomosing, the reticulations slender, distinct; petioles 2.5 to 4.5 cm long; stipules subpersistent, subchartaceous or membranaceous, oblong-ovate, subacute, 3 to 4 cm long. Flowers unknown, axillary, in few-flowered simple umbels or fascicles. Fruits fleshy, ovoid or ovoid-globose, about 2 cm in diameter, 5-celled, crowned by the persistent calyx-rim, one in each axil with pedicels 1 to 1.5 cm long, or two on a common peduncle, the peduncle and pedicels each less than 1 cm long.

LEYTE, mountains back of Dagami, *Bur. Sci. 15372 Ramos*, August 13, 1912, in forests.

A species apparently belonging in the same group with *Urophyllum*

[5] Prodr. 4 (1830) 440.

bataanense Elm., but well characterized by its very large, subpersistent stipules. The fruits are also larger than in any other known Philippine form.

UROPHYLLUM LEYTENSE sp. nov.

Species praecedenti similis et affinis, differt foliis oblongo-obovatis, breviter obtuse acuminatis, nervis utrinque circiter 10, stipulis minoribus circiter 2 cm longis, strigoso-hirsutis, apice 2-lobatis.

A shrub less than 1 m high, *fide* Ramos, nearly glabrous except the distincly strigose-hirsute stipules and buds. Branches stout, the younger ones compressed, straw-colored when dry. Leaves oblong-obovate, 13 to 18 cm long, 5.5 to 8 cm wide, chartaceous or subcoriaceous, of the same color, rather pale, and uniformly shining on both surfaces when dry, the apex shortly and rather abruptly blunt-acuminate, the base acute, sometimes a little decurrent; lateral nerves about 10 on each side of the midrib, prominent, curved, anastomosing, the reticulations rather lax, prominent on both surfaces; petioles 3 to 4 cm long; stipules broadly ovate, about 2 cm long, chartaceous, distinctly appressed strigose-hirsute with short grayish hairs, subpersistent, shortly 2-cleft at the apex, the lobes acute, 2 to 3 mm long. Flowers 5-merous, axillary, subsolitary or fascicled, the pedicels (in bud) about 5 mm long, in young fruit 2.5 cm long. Calyx urceolate, the limb obscurely 5-toothed, slightly pubescent. Ovary 5-celled. Fruit (young) depressed-globose or obovoid, slightly pubescent, fleshy, 5 to 8 mm in diameter.

LEYTE, mountains back of Dagami, *Bur. Sci. 15289 Ramos*, August 13, 1912, in forests.

Manifestly allied to *Urophyllum grandistipulum*, but with smaller stipules which are cleft at the apex, smaller fruits, and differently shaped, fewer-nerved leaves.

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ILLUSTRATION

Plate I

Hedyotis prostrata (Bl.) Korth. Presumably the type of *Metabolos prostratus* Blume Bijdr. (1826) 991. One of the Javan specimens in the Rijks Herbarium, Leiden, Holland, collected and so named by Blume. (Photograph by Cortes.)

PLATE I. HEDYOTIS PROSTRATA (Bl.) Korth.

Presumably the type of *Metabolos prostatus* Blume Bijdr. (1826) 991. One of the Javan specimens in the Rijks Herbarium collected and so named by Blume.

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CONTRIBUTIONS TO THE BRYOLOGICAL FLORA OF THE PHILIPPINES, IV [1]

By V. F. BROTHERUS
(*Helsingfors, Finland*)

SPHAGNACEAE

SPHAGNUM (Dill.) Ehrenberg

SPHAGNUM JUNGHUHNIANUM Doz. et Molk.

LUZON, Subprovince of Benguet, Mount Pulog, *For. Bur. 16416 Curran, Merritt, & Zschokke.*

SPHAGNUM MALACCENSE Warnst.

LUZON, Subprovince of Benguet, Mount Pulog, *Merrill 6402, For. Bur. 16395, 16410 Curran, Merritt, & Zschokke.*

SPHAGNUM LUZONENSE Warnst.

LUZON, Subprovince of Benguet, Pauai, *Merrill 6678.*

DICRANACEAE

TREMATODON Michaux

TREMATODON PAUCIFOLIUS C. Müll.

LUZON, Subprovince of Benguet, Sablang, *Bur. Sci. 12798, 12801 Fénix.*

WILSONIELLA C. Müller

WILSONIELLA SQUARROSA Broth. sp. nov.

Autoica; tenella, caespitosa, caespitibus laxis, lutescenti-viridibus, vix nitidiusculis; *caulis* erectus, vix ultra 5 mm longus, basi fusco-radiculosus, densiuscule foliosus, simplex vel furcatus; *folia* sicca et humida squarrosa, lineari-lanceolata, acutiuscula

[1] The geographic distribution is not indicated in the present paper for those species which were included in the former parts.

vel obtusa, marginibus recurvis, summo apice denticulatis, nervo tenui, longe infra apicem folii evanido, cellulis teneris, laxe oblongo-hexagonis; *seta* c. 10 mm alta, sicca flexuosula, tenuissima, lutea; *theca* suberecta, cylindracea, brevicollis, sicca deoperculata sub ore contractula, fuscidula, laevis; *annulus* latus; *exostomii* dentes usque ad basim divisi, cruribus filiformibus, dense papillosis, rubris; *spori* 0.017-0.020 mm, ochracei, papillosi; *operculum* e basi conica, longe et oblique subulatum; *calyptra* cucullata, integra.

LUZON, Province of Laguna, Calauan, *Bur. Sci. 12512 McGregor.*
Species foliis squarrosis oculo nudo jam dignoscenda.

DITRICHUM Timm

DITRICHUM DIFFICILE (Dub.) Fleisch.

LUZON, Subprovince of Benguet, in ravines, on earth banks, altitude 1,500 m, *Merrill 7847;* Pauai, *Bur. Sci. 8692 McGregor,* altitude about 2,100 m: Subprovince of Lepanto, Mount Data, *Bur. Sci. 5957 Ramos,* altitude about 2,100 m: Province of Laguna, Mount Banajao, damp slopes in forest, altitude 2,100 m, *Merrill 7527.* NEGROS, Canlaon Volcano, on earth, old crater, altitude 2,000 m, *Merrill 6805, 6820, 6828.*

CERATODON Bridel

CERATODON STENOCARPUS Bryol. eur.

LUZON, Subprovince of Bontoc, *Vanoverbergh 1312,* altitude 1650 m.

CAMPYLOPODIUM (C. Müll.) Bescherelle

CAMPYLOPODIUM EUPHOROCLADUM (C. Müll.) Besch.

LUZON, Subprovince of Benguet, Baguio and vicinity, on shaded banks of streams, altitude about 1,400 m, *Bur. Sci. 14050 Robinson.*

DICRANELLA Schimper

DICRANELLA COARCTATA (C. Müll.) Bryol. jav.

LUZON, Subprovince of Bontoc, *Vanoverbergh 548.*
Area: Java.

BRAUNFELSIA Paris

BRAUNFELSIA DICRANOIDES (Doz. et Molk.) Broth.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1281.*
Area: Java and New Guinea.

DICRANOLOMA Renault

DICRANOLOMA BLUMEI (Nees) Ren.

LUZON, Province of Laguna, Mount Banajao, altitude about 2,270 m, *Merrill 7529:* Province of Tayabas, Infanta, *Bur. Sci. 9403 Robinson.*

DICRANOLOMA BRAUNII (C. Müll.) Par., f. **MINDANENSE** Fleisch.

LUZON, Subprovince of Bontoc, *Vanoverbergh 524.*

PILOPOGON Bridel

PILOPOGON BLUMEI (Doz. et Molk.) Broth.

LUZON, Subprovince of Benguet, Baguio and vicinity, *Bur. Sci. 12,000 Robinson:* Subprovince of Bontoc, on ground, altitude 1,350 m, *Vanoverbergh 329, 1083.* NEGROS, Canlaon Volcano, open seepage slopes, altitude about 2,000 m, *Merrill 6812.*

DICRANODONTIUM Bryol. eur.

DICRANODONTIUM DICTICYON (Mitt.) Jaeg.

LUZON, Province of Laguna, Mount Banajao, *Bur. Sci. 6593 Robinson:* Subprovince of Benguet, Pauai, altitude about 2,100 m, *Bur. Sci. 8699 McGregor.*

Area: Sikkim.

FISSIDENTACEAE

FISSIDENS Hedwig

FISSIDENS SCHMIDII C. Müll.

LUZON, Subprovince of Bontoc, on wet soil, altitude 1,250 m, *Vanoverbergh 1352.*

Area: Nilghiri, Ceylon, and Java.

FISSIDENS ZIPPELIANUS Doz. et Molk.

LUZON, Province of Bataan, Lamao, *For. Bur. 15564 Curran:* Subprovince of Bontoc, on rocks, altitude about 1,200 m, *Vanoverbergh 1260.*

Area: Ceylon, Malacca, Sumatra, Java, Andamans, Hongkong, and New Guinea.

FISSIDENS NOBILIS Griff.

LUZON, Subprovince of Benguet, damp ravines in limestone formation, altitude about 1,500 m, *Merrill 7827;* Sablang, *Bur. Sci. 12805 Fénix:* Subprovince of Bontoc, *Vanoverbergh 546.* NEGROS, Canlaon Volcano, on damp shaded cliffs in ravines, altitude 1,100 m, *Merrill 6831.* PALAWAN, *Merrill 7269.* POLILLO, *Bur. Sci. 10516 McGregor.*

LEUCOBRYACEAE

LEUCOBRYUM Hampe

LEUCOBRYUM SANCTUM Hampe.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 12097 Ramos:* Province of Nueva Ecija, *For. Bur. 22203 Alvarez:* Province of Cagayan, Abulug River, *Weber 1592,* on rotten logs near streams, *Bur. Sci. 14584 Ramos, For. Bur. 16644 Curran:* Province of Rizal, *Bur. Sci. 13443 Ramos.* POLILLO, *Bur. Sci. 10508 McGregor.*

LEUCOBRYUM JAVENSE Mitt.

LUZON, Subprovince of Bontoc, *Vanoverbergh 1019.* NEGROS, Canlaon Volcano, mossy forest, on earth, altitude 2,100 m, *Merrill 6806.*

LEUCOBRYUM BOWRINGII Mitt.

LUZON, Province of Laguna, *For. Bur. 19127 Tamesis.*

OCTOBLEPHARUM Hedwig

OCTOBLEPHARUM ALBIDUM (L.) Hedw.

LUZON, Province of Laguna, Calauan, *Bur. Sci. 12513 McGregor:* Subprovince of Benguet, Sablang, *Bur. Sci. 12809 Fénix.*

SCHISTOMITRIUM Dozy et Molkenboer

SCHISTOMITRIUM APICULATUM Doz. et Molk.

MINDANAO, Subprovince of Butuan, on tree trunks, altitude 404 m, *Weber 1297.*

SCHISTOMITRIUM ROBUSTUM Doz. et Molk.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9367 Robinson.*
Area: Java.

LEUCOPHANES Bridel

LEUCOPHANES ALBESCENS C. Müll.

POLILLO, *Bur. Sci. 9066 Robinson.*

LEUCOPHANES CANDIDUM (Hornsch.) Lindb.

LUZON, Province of Tayabas, Quinatacutan, *Bur. Sci. 13211 Foxworthy & Ramos.* MINDANAO, Subprovince of Butuan, on tree trunks, altitude 251 m, *Weber 1332.*

CALYMPERACEAE

SYRRHOPODON Schwaegrichen

SYRRHOPODON TRISTICHUS Nees.

NEGROS, Mount Marapara, *For. Bur. 13645 Curran & Foxworthy.*
Area: Ceylon, Sumatra, Java, and Amboina.

SYRRHOPODON ALBOVAGINATUS Schwaegr.

LUZON, Province of Laguna, Paete, *Bur. Sci. 10060 Ramos.*

SYRRHOPODON CILIATUS (Hook.) Schwaegr.

MINDANAO, Subprovince of Butuan, on trunks of palm trees, *Weber 1329.*
Area: Malacca, Sumatra, Celebes, Borneo, Burma, Ternate, Amboina, and New Guinea.

SYRRHOPODON MÜLLERI (Doz. et Molk.) Lac.

LUZON, Province of Tayabas, Tagcauayan, *Bur. Sci. 13097 Foxworthy & Ramos.*
Area: Ceylon, Malacca, Sumatra, Java, Banca, Celebes, Borneo, New Guinea, and Samoa.

CALYMPERES Swartz

CALYMPERES ORIENTALE Mitt.

MINDANAO, Subprovince of Butuan, on pandan trees, altitude 12 m, *Weber 1326*, POLILLO, *Bur. Sci. 9281 Robinson, Bur. Sci. 10505 McGregor.*
Area: Labuan and Java.

Var. **POLYTRICHOIDES** Fleisch.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 1,600 m, *Bur. Sci. 9805 Robinson.*
Area: Malacca and Java.

CALYMPERES (HYOPHILINA, STENOCYCLA) CLEMENSIAE Broth. sp. nov.

Dioicum; robustiusculum, caespitosum, caespitibus densis, mollibus, lutescenti-viridibus, opacis; *caulis* erectus, vix ultra 5 mm longus, basi fusco-radiculosus, dense foliosus, simplex; *folia* sicca circinato-crispula, marginibus involutis, humida patentia, canaliculato-concava, a basi brevi, vix latiore linearia, acutiuscula vel plus minusve obtusa, c. 5 mm longa, apice et in parte superiore basis minutissime serrulata, nervo valido, lutescente, infra summum apicem folii evanido, dorso scabro, cellulis laminalibus ubique unistratosis, minutissimis, subrotundis, chlorophyllosis, minute papillosis, basin versus breviter rectangularibus, pellucidis, cancellinae brevis rectangularisque breviter et laxe rectangularibus, in seriebus c. 6 subaequilongis dispositis, marginalibus multo minoribus et angustioribus, pluriseriatis, teniolis nullis. Caetera ignota.

MINDANAO, Lake Lanao, Camp Keithley, *Mrs. Clemens "T".*

Species valde peculiaris, habitu *Tortellae tortuosae* persimilis, cum nulla alia commutanda.

POTTIACEAE

HYMENOSTYLIUM Bridel

HYMENOSTYLIUM LUZONENSE Broth.

LUZON, Subprovince of Benguet, on limestone cliffs, altitude about 1,500 m, *Merrill 7864;* Baguio and vicinity, on limestone cliffs, 1,400 to 1,450 m altitude, *Bur. Sci. 14007, 14130 Robinson.*

TRICHOSTOMUM Hedwig

TRICHOSTOMUM SUBDURIUSCULUM (C. Müll.) Broth.

LUZON, Subprovince of Benguet, Baguio and vicinity, *Bur. Sci. 14019 Robinson.* MINDANAO, Subprovince of Butuan, on damp rocks, at low altitudes, *Weber 1308, 1315, 1319, 1331.*

Area: Philippines.

TIMMIELLA (De Not.) Limprecht

TIMMIELLA MERRILLII Broth.

LUZON, Subprovince of Bontoc, on earth, altitude 1650 m, *Vanoverbergh 1307.*

BARBULA Hedwig

BARBULA ORIENTALIS (Willd.) Broth.

LUZON, Subprovince of Bontoc, on earth, altitude 1650 m, *Vanoverbergh 1306.*

MERCEYOPSIS Broth. et Dixon

MERCEYOPSIS MINUTA (Broth.) var. **SUBMINUTA** (Broth.) Broth. et Dix.

Merceya subminuta Broth. in Philip. Journ. Sci. 5 (1910) Bot. 143.

LUZON, Subprovince of Benguet, Baguio and vicinity, on rocks, altitude about 1,400 m, *Bur. Sci. 14054 Robinson.*

ORTHOTRICHACEAE

MACROMITRIUM Bridel

MACROMITRIUM REINWARDTII Schw.

LUZON, Province of Laguna, Mount Banajao, *Merrill 7530.*

MACROMITRIUM ANGUSTIFOLIUM Bryol. jav.

LUZON, Subprovince of Benguet, Pauai, altitude about 2,100 m, *Bur. Sci. 8705 McGregor.*

Area: Sumatra, Java, Amboina, Celebes, and Borneo.

MACROMITRIUM CELEBENSE Par.

MINDANAO, Subprovince of Butuan, on bark of trees, *Weber 1298* (alt. 91 m), *1314* (alt. 396 m).

Area: Java and Celebes.

MACROMITRIUM SALAKANUM C. Müll.

LUZON, Province of Cagayan, Claveria, *Bur. Sci. 10739 McGregor.*

Area: Java and New Caledonia.

MACROMITRIUM SEMIPELLUCIDUM Doz. et Molk.

MINDANAO, Subprovince of Butuan, on tree trunks, alt. 10-15 m, *Weber 1301, 1305.*

MACROMITRIUM MERRILLII Broth.

LUZON, Province of Tayabas, Kabibihan, *Bur. Sci. 13149 Foxworthy & Ramos.*

MACROMITRIUM SULCATUM (Hook. et Grev.) Brid.

LUZON, Subprovince of Benguet, on trees in the mossy forest, altitude 2,000 to 2,250 m, *Merrill 7824, 7867.*

MACROMITRIUM GONIORRHYNCHUM (Doz. et Molk.) Mitt.

LUZON, Province of Rizal, on trees, *Bur. Sci. 12550 Ramos:* Subprovince of Benguet, on trees, altitude about 1,500 m, *Merrill;* Sablang, *Bur. Sci. 12806 Fénix;* Baguio and vicinity, on trees, altitude 1,350 m, *Bur. Sci. 14106 Robinson.*

SCHLOTHEIMIA Bridel

SCHLOTHEIMIA LUZONENSIS Broth.

LUZON, Subprovince of Benguet, *Bur. Sci. 5873 Ramos.*

SCHLOTHEIMIA WALLISII C. Müll.

LUZON, Subprovince of Benguet, Mount Pulog, *For. Bur. 16401 Curran, Merritt, & Zschokke.*

SPLACHNACEAE

SPLACHNOBRYUM C. Müller

SPLACHNOBRYUM LUZONENSE Broth. sp. nov.

Dioicum; tenellum, caespitosum, caespitibus densis, mollibus, viridibus, vix nitidiusculis; *caulis* erectus, vix ultra 3 mm longus, inferne fusco-radiculosus, densiuscule foliosus, simplex; *folia*

patentia, carinato-concaviuscula, infima ovata, superiora oblonga vel ovato-oblonga, rotundato-obtusa, marginibus indistincte recurvis, summo apice crenulatis, nervo tenui, infra summum apicem folii evanido, cellulis latis, teneris, superioribus ovali-hexagonis, marginalibus minoribus, subquadratis, basilaribus multo majoribus, oblongo-hexagonis; *seta* 3-4 mm alta, tenuissima; *theca* erecta, anguste cylindracea; *operculum* depressum, mammillatum.

LUZON, Province of Rizal, Malapad na Bato, on damp rocks, altitude 10 m, *Bur. Sci. 14136 Robinson.*

Species *S. Oorschotii* (Lac.) C. Müll. affinis, sed statura multo tenuiore oculo nudo jam dignoscenda.

FUNARIACEAE

FUNARIA Schreber

FUNARIA CALVESCENS Schwaegr.

LUZON, Subprovince of Benguet, on damp banks, altitude about 1,800 m, *Merrill 7836:* Subprovince of Bontoc, Bauco, dry hillocks, altitude 1,300 m, *Vanoverbergh 67.*

BRYACEAE

WEBERA Hedwig

WEBERA HAMPEANA (Bryol. jav.) Broth.

NEGROS, Canlaon Volcano, open slopes, old crater, altitude 2,000 m, *Merrill 6808.*

WEBERA DURIUSCULA Broth. sp. nov.

Paroica; gracilis, caespitosa, caespitibus densis, rigidis, fuscescenti-viridibus, nitidiusculis; *caulis* erectus, cum innovationibus usque ad 1 cm longus, inferne nudus, fusco-radiculosus, dein dense foliosus, innovando-ramosus vel simplex; *folia* erecto-patentia, carinato-concava, lanceolata, breviter acuminata, acuta, marginibus ultra medium anguste revolutis vel suberectis, superne minute serrulatis, nervo validiusculo, infra apicem folii evanido, cellulis laxiusculis, oblongo-hexagonis vel rhomboideis, basilaribus rectangularibus, ad angulos quadratis; *seta* c. 2 cm alta, tenuis, lutescenti-rubra nitidiuscula; *theca* nutans, e collo longiusculo turgide ovalis, sicca deoperculata sub ore paulum constricta, fuscidula; *peristomium....?; operculum* convexum, acute apiculatum, nitidum.

NEGROS, Canlaon Volcano, open places, altitude about 2,200 m, *Merrill 6832*, and ravines in slopes of the new cone, altitude about 2,000 m, *Merrill 6814.*

Species *P. nutanti* (Schreb.) affinis, sed foliis minutis serrulatis, laxius reticulatis dignoscenda.

BRACHYMENIUM Schwaegrichen

BRACHYMENIUM EXILE (Doz. et Molk.) Bryol. jav.

LUZON, Subprovince of Bontoc, Bauco, dry hillocks, altitude 1,300 m, *Vanoverbergh 66.*

BRACHYMENIUM COARCTATUM (C. Müll.) Bryol. jav.

LUZON, Subprovince of Bontoc, on earth, altitude 1,650 m, *Vanoverbergh 1308.*

Area: Java, New Zealand, and New Caledonia.

BRACHYMENIUM NEPALENSE Hook.

LUZON, Subprovince of Benguet, on trees, altitude about 1,500 m, *Merrill 7876;* Mount Tonglon, on trees, altitude about 2,000 m, *Merrill 7841;* Baguio and vicinity, altitude about 1,400 m, *Bur. Sci. 11993 Robinson:* Subprovince of Bontoc, on trees, altitude about 1,650 m, *Vanoverbergh 523, 1116.*

ANOMOBRYUM Schimper

ANOMOBRYUM CYMBIFOLIUM (Lindb.) Broth.

LUZON, Subprovince of Benguet, on limestone boulders, altitude about 1,450 m, *Merrill 7878.*

BRYUM (Dill.) Schimper

BRYUM COMPRESSIDENS C. Müll.

LUZON, Province of Batangas, Santo Tomas, *Bur. Sci. 13743 Ramos*
Area: Nepal, Bali, Java.

BRYUM ARGENTEUM L.

LUZON, Subprovince of Bontoc, Bauco, dry hillocks, altitude 1,300 m, *Vanoverbergh 65.*

BRYUM ERECTUM Broth.

LUZON, Subprovince of Benguet, on limestone boulders, altitude about 1,500 m, *Merrill 7860.*

BRYUM CORONATUM Schwaegr.

LUZON, Province of Bataan, *For. Bur. 19161 Curran:* Province of Rizal, Montalban, *Bur. Sci. 9522, 9523 Robinson.* TAWI TAWI, *Bur. Sci. 10832 Foxworthy.*

BRYUM AMBIGUUM Dub.

LUZON, Subprovince of Benguet, *Bur. Sci. 5865 Ramos* (f. fol. nervo longius excedente).

BRYUM RAMOSUM (Hook.) Mitt.

LUZON, Subprovince of Benguet, Baguio and vicinity, on rocks, altitude 1,400 m, *Bur. Sci. 14056 Robinson.*

RHODOBRYUM (Schimp.) Hampe

RHODOBRYUM GIGANTEUM (Hook.) Hamp.

NEGROS, Canlaon Volcano, mossy forest, altitude about 2,000 m, *Merrill 6834.* LUZON, Province of Laguna, Mount Banajao, altitude about 2,100 m, *Merrill 7526.*

MNIACEAE

ORTHOMNIUM Wilson

ORTHOMNIUM LOHERI Broth.

LUZON, Subprovince of Bontoc, *Vanoverbergh 527, 796, 1077, 1282:* Subprovince of Benguet, on trees in ravines, altitude about 1,500 m, *Merrill 7843, 7855, 7875;* Mount Pulog, *Merrill 6399;* Mount Tonglon, on trees, altitude 1900–2000 m, *Merrill 7837, 7845.*

MNIUM (Dill.) Linnaeus

MNIUM ROSTRATUM Schrad.

LUZON, Subprovince of Benguet, on wet limestone cliffs, altitude about 1,500 m, *Merrill 7856.*

MNIUM SUCCULENTUM Mitt.

LUZON, Subprovince of Bontoc, *Vanoverbergh 1060.*
Area: Nepal, Khasia, Assam, Sumatra, Java.

RHIZOGONIACEAE

HYMENODON Hook. f. et Wilson

HYMENODON SERICEUS (Doz. et Molk.) C. Müll.

NEGROS, Canlaon Volcano, on very mossy trees, altitude 2,000 m, *Merrill 6833.*

RHIZOGONIUM Bridel

RHIZOGONIUM SPINIFORME (L.) Bruch.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1378, 1039:* Province of Laguna, Paete, *Bur. Sci. 10062 Ramos:* Province of Albay, Mount Mayon, *Bur. Sci. 6479 Robinson*: Province of Rizal, San Isidro, *Bur. Sci. 12125 Ramos.* MINDANAO, District of Zamboanga, on boulders in shaded ravines, *Merrill 8357:* Subprovince of Butuan, on tree trunks, altitude 326 m, *Weber 1294.* NEGROS, Canlaon Volcano, on boulders, ravines at 1,100 m, *Merrill 6827.* POLILLO, *Bur. Sci. 9036 Robinson, Bur. Sci. 10518 McGregor.*

SPIRIDENTACEAE

SPIRIDENS Nees

SPIRIDENS REINWARDTII Nees.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9451 Robinson.* MINDANAO, District of Davao, on trees, altitude 1,000 m, *Weber 1475.*

SPIRIDENS LONGIFOLIUS Lindb.

LUZON, Subprovince of Bontoc, on trees, altitude 1,450 m, *Vanoverbergh 673:* Subprovince of Benguet, Mount Tonglon, on tree-ferns (*Cyathea*), altitude about 1,800 m, *Merrill 7862.*

BARTRAMIACEAE

PHILONOTIS Bridel

PHILONOTIS GRIFFITHIANA (Wils.) Mitt.

LUZON, Subprovince of Benguet, *For. Bur. 15634 Curran.*

PHILONOTIS SECUNDA (Doz. et Molk.) Bryol. jav.

LUZON, Subprovince of Benguet, *Bur. Sci. 5512 Ramos* (f. robusta); Pauai, altitude about 2,100 m, *Bur. Sci. 8695 McGregor.* MINDANAO, Subprovince of Butuan, on damp rocks, altitude 106 m, *Weber 1303.*

PHILONOTIS REVOLUTA Bryol. jav.

LUZON, Subprovince of Benguet, *For. Bur. 15917 Bacani;* Pauai, *Merrill 6676;* Sablang, *Bur. Sci. 12808 Fénix:* Subprovince of Bontoc, *Vanoverbergh 779:* Province of Rizal, *Bur. Sci. 6783 Robinson;* Montalban, on damp cliffs, altitude 40 m, *Bur. Sci. 9649 Robinson.*

Area: Java, Tonkin, Philippines.

PHILONOTIS MOLLIS (Doz. et Molk.) Bryol. jav.

LUZON, Subprovince of Lepanto, Malaya Mountains, *Bona 149.*

Area: Southern India, Andamans, Java, Sumatra, Tonkin.

PHILONOTIS SPECIOSA (Griff.) Mitt.

LUZON, Subprovince of Bontoc, Bauco, on rocks along streams, altitude 1,200 m, *Vanoverbergh 10.*

Area: Nepal, Sikkim, Khasia.

BREUTELIA Schimper

BREUTELIA ARUNDINIFOLIA (Dub.) Broth.

LUZON, Province of Laguna, Mount Banajao, altitude 2,100 m, *Merrill 7528.*

CRYPHAEACEAE

ACROCRYPHAEA Bryol. eur.

ACROCRYPHAEA CONCAVIFOLIA (Griff.) Bryol. jav.

LUZON, Subprovince of Bontoc, on trees, *Vanoverbergh 1011.*

Area: Nepal, Assam, Coorg, Ceylon, Java, Celebes.

PRIONODONTACEAE

NEOLINDBERGIA Fleischer

NEOLINDBERGIA RUGOSA (Mont.) Fleisch.

MINDANAO, District of Zamboanga, on trees, altitude about 800 m, *Merrill 8361.*

Area: Celebes and the Philippines.

CYRTOPODACEAE

BESCHERELLEA Duby

BESCHERELLEA PHILIPPINENSIS Broth. sp. nov.

Dioica; gracilescens, caespitosa, caespitibus laxis, rigidis, fuscescenti-viridibus, opacis, *caulis* primarius brevis, fusco-tomentosus; *caules secundarii* usque ad 10 cm longi, ubique dense foliosi, inferne simplices, dein plus minusve dense pinnatim ramosi, ramis erecto-patentibus, usque ad 1.5 cm longis, dense foliosis, acutis, juniores simplices; *folia* sicca adpressa, acumine

plus minusve patente, humida patentia, e basi ovali sensim anguste lanceolato-subulata, aristata, usque ad 5 mm longa, marginibus erectis, superne remote serratis, nervo in aristam longe excedente, cellulis minutis, incrassatis, laminalibus et basilaribus externis parenchymaticis, basilaribus internis elongatis, angustis; *seta* vix ultra 5 mm alta, tenuis, rubra; *theca* erecta, subcylindracea, castanea nitidiuscula. Caetera ignota.

MINDANAO, District of Zamboanga, on trees, altitude about 200 m, *Merrill 8354.*

Species *B. cyrtopodi* F. v. Müll. affinis, sed seta brevi foliisque longe aristatis dignoscenda.

PTYCHOMNIACEAE

GLYPTOTHECIUM Hampe

GLYPTOTHECIUM SCIUROIDES (Hook.) Hamp.

LUZON, Subprovince of Benguet, Mount Tonglon, on trees, altitude about 1,800 m, *Merrill 7871.*

Area: Java, eastern Australia, Tasmania, New Zealand, New Guinea.

HAMPEELLA C. Müller

HAMPEELLA LEPTODICTYON Broth. sp. nov.

Dioica; gracilescens, pallide viridis, sericeo-nitens; *caulis* elongatus, repens, per totam longitudinem hic illic fasciculatim fusco-radiculosus, dense foliosus, dense subpinnatim ramosus, ramis adscendentibus vel suberectis, vix ultra 1 cm longis, densiuscule et complanate foliosis, obtusis, superne pilis numerosis articulatis fuscis instructis; *folia ramea* lateralia patula, oblongo-lanceolata, plerumque breviter acuminata, marginibus erectis vel inferne uno latere anguste recurvis, e medio ad apicem serrulatis, nervis binis, brevissimis vel nullis, cellulis angustissime linearibus, basilaribus infimis laxis, abbreviatis, hyalinis. Caetera ignota.

MINDANAO, Subprovince of Butuan, on tree, altitude 7 m, *Weber 1313.*

Species *H. pallenti* (Lac.) Fleisch. valde similis, sed foliis erectioribus, densius areolatis dignoscenda.

MYURIACEAE

MYURIUM Schimper

MYURIUM RUFESCENS (Reinw. et Hornsch.) Fleisch.

LUZON, Province of Albay, Mount Mayon, *Bur. Sci. 6492 Robinson* (f. gracilis. NEGROS, Calaon Volcano, on trees, mossy forest, altitude 2,000–2,200 m, *Merrill 6804, 6810, 6830.*

Area: Khasia, Ceylon, Sumatra, Java, Borneo, Amboina.

MYURIUM FOXWORTHYI (Broth.) Broth.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 1,900 m, *Bur. Sci. 9822 Robinson.*

NECKERACEAE

PTEROBRYELLA (C. Müll.) C. Müller

PTEROBRYELLA LONGIFRONS (C. Müll.) C. Müll.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 1,750 m, *Bur. Sci. 9811 Robinson.*

TRACHYLOMA Bridel

TRACHYLOMA INDICUM Mitt.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 800 m, *Bur. Sci. 9816 Robinson.*

Area: Ceylon, Sumatra, Java, Ceram, Halmaheira, New Guinea.

JAEGERINA C. Müller

JAEGERINA LUZONENSIS Broth. sp. nov.

Dioica; robustiuscula, caespitosa, caespitibus laxis, rigidis, pallide lutescenti-viridibus, aetate fuscescentibus, vix nitidiusculis; *caulis primarius* filiformis, repens, niger, parce radiculosus, foliis squamiformibus, laxe dispositis, plerumque destructis; *caules secundarii* usque ad 10 cm longi, flexuosi, apice arcuati, basi foliis destructis, dein dense foliosi, plerumque simplices, raro superne dichotomi, obtusi; *folia* sicca et humida e basi adpressa horride patula, pluries plicata, e basi cordato-ovata lanceolato-acuminata, acuta, marginibus erectis, superne minute serrulatis, nervo tenui, longe infra apicem folii evanido, cellulis valde incrassatis, lumine angustissimo, flexuoso, superioribus dorso minutissime papillosis, basilaribus infimis, brevioribus et laxioribus, fusco-aureis, alaribus vix diversis. Caetera ignota.

LUZON, Subprovince of Benguet, on trees, altitude about 1,500 m, *Merrill 7873.*

Species *J. stoloniferae* C. Müll. habitu simillima, sed foliis cellulis valde incrassatis, lumine angustissimo, flexuoso dignoscenda.

ENDOTRICHELLA C. Müller

ENDOTRICHELLA ELEGANS (Doz. et Molk.) Fleisch.

LUZON, Subprovince of Benguet, Baguio and vicinity, on trees, altitude about 1,450 m, *Bur. Sci. 14075 Robinson*: Subprovince of Bontoc, on trees, altitude about 1,450 m, *Vanoverbergh 437:* Province of Pampanga, Mount Arayat, *For. Bur. 19348 Curran.*

ENDOTRICHELLA GRACILESCENS Broth. sp. nov.

Dioica; gracilescens, lutescenti-viridis, nitida; *caulis primarius* brevis, fusco-tomentosus; *caules secundarii* usque ad 10 cm longi, flexuosi, laxiuscule foliosi, simplices; *folia* sicca horride

patula, humida horizontalia, profunde pluries plicata, infima ovalia vel oblonga, subito in subulam brevem vel longiorem contracta, caetera multo angustiora, e basi ovali sensim lanceolato-subulata, marginibus inferne anguste revolutis, superne argute serratis, dentibus minutis interjectis, nervis binis brevibus, cellulis valde inter se porosis, anguste prosenchymaticis, apicalibus brevioribus et laxioribus, basilaribus infimis, laxis, abbreviatis, luteis, alaribus vix diversis; *bracteae perichaetii* minutae, erectae, externae sensim subulatae, intimae obtusae, apice erosodentatae; *seta* c. 1.6 mm alta, lutescenti-rubra, laevis; *theca* erecta, oblonga, paulum asymmetrica, fuscidula, laevis; *annulus* 0; *peristomium* ut in *E. elegante; spori* 0.015–0.017 mm, fusciduli, papillosi; *operculum* e basi conica breviter et oblique rostratum; *calyptra* ignota.

MINDANAO, Subprovince of Butuan, on tree trunks, altitude 404 m, *Weber 1328.*

Species pulchella, praecedenti affinis, sed statura multo graciliore oculo nudo jam dignoscenda.

ENDOTRICHELLA PERPLICATA Broth. sp. nov.

Species *E. Wallisii* et *E. eleganti* statura similis, sed foliis omnibus conformibus, angustioribus longius subulatis, distinctius plicatis dignoscenda.

LUZON, Province of Rizal, San Isidro, *Bur. Sci. 12126 Ramos.*

ENDOTRICHELLA PILIFERA Broth. sp. nov.

Dioica; robusta, viridissima, nitidiuscula; *caulis primarius* brevis, fusco-tomentosus; *caules secundarii* usque ad 10 cm longi, flexuosi, dense foliosi, simplices vel furcati; *folia* sicca erecto-patentia, humida patentia, conformia, mollia, haud vel indistincte plicata, oblonga, sensim lanceolato-subulata, piliformiter acuminata, marginibus inferne recurvis, superne minute serrulatis, enervia, cellulis inter se porosis, laxiuscule rhomboideis, chlorophyllosis, apicalibus brevioribus, basilaribus infimis laxis, abbreviatis, valde inter se porosis, luteis, alaribus haud diversis. Caetera ignota.

MINDANAO, Subprovince of Butuan, on tree trunks, altitude 15 m, *Weber 1318.*

Species pulcherrima, colore viridissimo foliisque piliferis prima fronte dignoscenda.

GAROVAGLIA Endlicher

GAROVAGLIA PLICATA (Nees) Endl.

LUZON, Subprovince of Bontoc, *Vanoverbergh 522.*

SYMPHYSODONTELLA Fleischer

SYMPHYSODONTELLA SUBULATA Broth.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1364.*

Area: Philippines.

FLORIBUNDARIA C. Müller

FLORIBUNDARIA FLORIBUNDA (Doz. et Molk.) Fleisch.

LUZON, Subprovince of Benguet, *Bur. Sci. 12944 Fénix;* Baguio and vicinity, *Bur. Sci. 14014, 14023 Robinson:* Subprovince of Bontoc, altitude about 1,300 m, *Vanoverbergh 1008, 1265.* MINDANAO, District of Cotabato, *Bur. Sci. 11659 Robinson.*

PAPILLARIA (C. Müll.) C. Müller

PAPILLARIA FUSCESCENS (Hook.) Jaeg.

LUZON, Subprovince of Benguet, Mount Tonglon, on trees, altitude about 1,800 m, *Merrill 7829.*

Area: Himalaya, Khasia, Nilghiri, Coorg, Ceylon, Sumatra, Java, Ceram, Celebes, and Sumbava.

AEROBRYOPSIS Fleischer

AEROBRYOPSIS LANOSA (Mitt.) Broth.

POLILLO, *Bur. Sci. 10514 McGregor.*

Area: Sikkim, Ceylon, Sumatra, Celebes, Tonkin, Hongkong, Philippines, and Carolines.

BARBELLA (C. Müll.) Fleischer

BARBELLA PENDULA (Sull.) Fleisch.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude about 1,550 m, *Merrill 7531.*

BARBELLA (DICLADIELLA) HORRIDULA Broth. sp. nov.

Tenella, lutescens, nitidiuscula; *caulis* elongatus, per totam longitudinem ramulo arcte affixus, laxe foliosus, dense ramosus, ramis valde complanatis, laxiuscule foliosis, brevibus, erectis vel longe pendulis, basi tantum complanatis ibidemque simplicibus vel parce ramulosis, dein flagelliformibus; *folia caulina* suberecta, lanceolato-subulata, plus minusve distincte piliformiter acuminata, marginibus erectis, integris, nervo tenui, usque ad medium folii evanido, cellulis linearibus parce papillosis, subobscuris, basilaribus infimis abbreviatis, laxis, alaribus haud diversis; *folia lateralia* rami complanati horride patula, subulato-acuminata, marginibus superne serrulatis. Caetera ignota.

LUZON, Subprovince of Benguet, Sablang, *Bur. Sci. 12807 Fénix.*

Species ob staturam tenellam cum *B. trichode* Fleisch. comparanda, sed foliorum forma et structura jam longe diversa.

BARBELLA (DICLADIELLA) MACROBLASTA Broth. sp. nov.

Tenella, lutescens, sericeo-nitida; *caules secundarii* penduli, usque ad 20 cm longi, tenues, flexuosi, laxiuscule foliosi, remote ramosi, ramis brevibus, complanate foliosis vel longioribus, basi tantum complanatis, dein flagelliformibus, simplicibus; *folia caulina* suberecta, e basi pulchre auriculata lanceolato-subulata, pilo longissimo, minute denticulato terminata, marginibus basi inflexis, dein erectis, ubique distincte denticulatis, enervia, cellulis rhomboideo-linearibus, pellucidis, laevibus, basilaribus brevioribus, inter se porosis, alaribus numerosis, ovali-hexagonis vel subquadratis; *folia lateralia* rami complanati patentia, eisdem caulinis similia, sed argutius denticulatis cellulisque brevioribus. Caetera ignota.

LUZON, Subprovince of Bontoc, altitude 1,600 m, *Vanoverbergh 528.*

Species cum *B. subulifera* Fleisch. comparanda, sed foliis omnibus longe piliferis jam dignoscenda.

BARBELLA ENERVIS (Mitt.) Fleisch.

LUZON, Subprovince of Benguet, on trees in dense thickets, altitude about 1,500 m, *Merrill 7848:* Subprovince of Bontoc, on trees, *Vanoverbergh 980.*

Area: Ceylon, Coorg, Queensland, New South Wales, and Lord Howe's Island.

METEORIOPSIS Fleischer

METEORIOPSIS RECLINATA (C. Müll.) Fleisch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7874, Bur. Sci. 12940 Fénix;* Baguio and vicinity, on trees, altitude about 1,440 m, *Bur. Sci. 14012, 14021 Robinson:* Subprovince of Bontoc, on trees, altitude about 1,650 m, *Vanoverbergh 1274.*

AEROBRYUM Dozy et Molkenboer

AEROBRYUM SPECIOSUM Doz. et Molk.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1270.*

Area: Sikkim, Bhotan, Khasia, Ceylon, Java, Amboina, Celebes, Philippines.

TRACHYPODOPSIS Fleischer

TRACHYPODOPSIS CRISPATULA (Hook.) Fleisch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7826.*

TRACHYPUS Reinwardt et Hornschuch

TRACHYPUS SUBBICOLOR C. Müll.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1280.*

TRACHYPUS HUMILIS Lindb.

LUZON, Subprovince of Benguet, Mount Tonglon, on trees, altitude about 2,000 m, *Merrill 7839*.

Area: Japan.

PSEUDOSPIRIDENTOPSIS (Broth.) Fleischer

PSEUDOSPIRIDENTOPSIS HORRIDA (Broth.) Fleisch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7859*.

CALYPTOTHECIUM Mitten

CALYPTOTHECIUM TUMIDUM (Dicks.) Fleisch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7834, 7853:* Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1273, 1317*.

CALYPTOTHECIUM RAMOSII Broth. sp. nov.

Dioicum; gracilescens, rigidum, pallide lutescenti-viride, nitidum; *caulis primarius* repens, filiformis, foliis squamaeformibus remotis, parce radiculosus, ad insertionem caul. secundar. fusco-tomentosus; *caules secundarii* inter se remoti, vix ultra 5 cm longi, stricti nec penduli, rubri, inferne simplices, foliis squamaeformibus, plerumque destructis, dein laxiuscule complanate foliosi, pinnatim ramosi, ramis patulis, usque ad 1.5 cm longis, laxiuscule et complanate foliosis, simplicibus, obtusis; *folia caulina* horride patula, asymmetrica, laevia, e basi grosse auriculata, late ovali ligulata, sensim breviter acuminata, acuta, marginibus alis inflexis, caeterum erectis, minutissime serrulatis, nervo tenui, vix ultra medium folii producto, cellulis angustissimis, basilaribus laxioribus, inter se porosis, infimis laxis, plerumque fusco-aureis; *folia ramea* minora, minutius auriculata. Caetera ignota.

LUZON, Province of Rizal, *Bur. Sci. 13446 Ramos.*
Species distinctissima, cum nulla alia commutanda.

NECKEROPSIS Reichardt

NECKEROPSIS LEPINEANA (Mont.) Fleisch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7881*.

NECKEROPSIS GRACILENTA (Bryol. jav.) Fleisch.

MINDANAO, District of Cotabato, *Bur. Sci. 11662 Robinson:* Subprovince of Butuan, on branches of trees, altitude 15 m, *Weber 1322*. POLILLO, *Bur. Sci. 10510 McGregor*.

HIMANTHOCLADIUM (Mitt.) Fleischer

HIMANTHOCLADIUM LORIFORME (Bryol. jav.) Fleisch.

LUZON, Subprovince of Benguet, Sablang, *Bur. Sci. 12811, 12945 Fénix:* Province of Laguna, Calauan, *Bur. Sci. 12511 McGregor.* MINDANAO, Subprovince of Butuan, on tree trunks, altitude 10–15 m, *Weber 1299, 1324.* POLILLO, *Bur. Sci. 6948 Robinson, Bur. Sci. 10507 McGregor.*

HOMALIODENDRON Fleischer

HOMALIODENDRON FLABELLATUM (Dicks.) Fleisch.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1315.*

PINNATELLA (C. Müll.) Fleischer

PINNATELLA ALOPECUROIDES (Hook.) Fleisch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7852.*
Area: Nepal, Bhotan, Sikkim, Burma, Ceylon, and Sumbava.

PINNATELLA LUZONENSIS Broth. sp. nov.

Species praecedenti habitu valde similis, sed foliis anguste et breviter acuminatis, limbo intralimbali nullo dignoscenda.

LUZON, Subprovince of Benguet, altitude above 1,500 m, *Merrill 7880.*

THAMNIUM Schimper

THAMNIUM ELLIPTICUM (Bryol. jav.) Kindb.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9322 Robinson.*
Area: Sumatra, Java, and the Philippines.

ENTODONTACEAE

CLASTOBRYUM Dozy et Molkenboer

CLASTOBRYUM MERRILLII Broth. sp. nov.

Dioicum; tenellum, caespitosum, caespitibus densis, rufescentibus, nitidiusculis; *caulis* elongatus, repens, hic illic fasciculatim fusco-radiculosus, dense pinnatim ramosus, ramis vix ultra 4 mm longis, adscendentibus vel suberectis, dense foliosis, teretibus, pilis axillaribus paucis instructis, simplicibus, obtusis; *folia ramea* sicca laxe imbricata, humida erecto-patentia, concava, e basi contracta ovalia, rarius ovata, acuta, marginibus late recurvis, minute serrulatis, enervia, cellulis anguste rhomboideis, apice papillose exstante, basilaribus infimis luteis, alaribus paucis, minutis, ovalibus, luteis; *bracteae perichaetii* internae erectae, lanceolato-acuminatae, argute serratae, dentibus patulis; *seta* c. 1 cm alta, tenuissima, rubra, laevissima. Caetera ignota.

LUZON, Subprovince of Benguet, Pauai, on tree trunks, *Merrill 6677.*

Species *C. indico* Doz. et Molk. affinis, sed statura tenuiore, foliis ovalibus vel ovatis, cellulis alaribus paucis, minutis, optime diversa.

ENTODON C. Müller

ENTODON LONGIDENS Broth.

LUZON, Subprovince of Benguet, *For. Bur. 15904 Bacani;* Mount Tonglon, on boulders in forests, *Merrill 7823.*

CAMPYLODONTIUM Dozy et Molkenboer

CAMPYLODONTIUM FLAVESCENS (Hook.) Bryol. jav.

MINDANAO, Subprovince of Bukidnon, altitude 575 m, *Weber 1506.*

ERYTHRODONTIUM Hampe

ERYTHRODONTIUM SQUARRULOSUM (Mont.) C. Müll.

LUZON, Province of Rizal, *Bur. Sci. 13645 Ramos:* Subprovince of Bontoc, on trees, altitude 1,300 m, *Vanoverbergh 1350.* MINDANAO, Subprovince of Bukidnon, *Weber 1508.*

FABRONIACEAE

FABRONIA Raddi

FABRONIA CURVIROSTRIS Doz. et Molk.

LUZON, Subprovince of Bontoc, on trees, altitude 1,250 m, *Vanoverbergh 1296.*

MERRILLIOBRYUM Brotherus

MERRILLIOBRYUM FABRONIOIDES Broth.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1286.*

HOOKERIACEAE

DALTONIA Hooker et Taylor

DALTONIA ANGUSTIFOLIA Doz. et Molk. var. **STRICTIFOLIA** (Mitt.) Fleisch.

NEGROS, Canlaon Volcano, on small trees in forests, altitude 2,200 m, *Merrill 6813.*

Area: Ceylon and Java.

ERIOPUS (Brid.) C. Müller

ERIOPUS MICROBLASTUS Broth. sp. nov.

Dioicus; gracilis, caespitosus, caespitibus laxis, pallide viridibus, vernicoso-nitidis; *caulis* vix ultra 1 cm longus, adscendens vel suberectus, basi fusco-tomentosus, laxe et complanate foliosus, secus totam longitudinem vel apice tantum saepe dense et fasciculatim rhizoideis fuscis instructus, simplex, obtusus vel breviter attenuatus; *folia* sicca vix mutata, lateralia patula, asymmetrica, ovalia, raptim breviter subulata, supra medium argute serrata, nervis binis, uno crasso, brevi, altero saepe nullo, cellulis ovali-hexagonis, collenchymaticis, superioribus minutis, dein sensim majoribus, basilaribus oblongo-hexagonis,

marginalibus angustissimis, limbum lutescentem, biseriatum efformantibus; folia dorsalia et ventralia oblique erecto-patentia, minora, late ovalia. Caetera ignota.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 1,750 m, *Bur. Sci. 9813 Robinson.*

Species ob foliorum cellulis minutis cum *E. parvireti* Fleisch. comparanda, sed foliis superne argute serratis jam dignoscenda.

CALLICOSTELLA (C. Müll.) Mitten

CALLICOSTELLA PAPILLATA (Mont.) Mitt.

LUZON, Province of Laguna, Los Baños, *Bur. Sci. 14148 Robinson:* Province of Rizal, *Bur. Sci. 13444, 13445 Ramos.* MINDANAO, District of Zamboanga, on rotten logs, altitude 800 m, *Merrill 8359* (forma seta superne scabriuscula).

CHAETOMITRIUM Dozy et Molkenboer

CHAETOMITRIUM ORTHORRHYNCHUM (Doz. et Molk.) Bryol. jav.

MINDANAO, District of Cotabato, on branches and twigs of trees, altitude 600 m, *Weber 1521.* POLILLO, *Bur. Sci. 10504, 10511 McGregor.*

Area: Sumatra, Java, Celebes, and Borneo.

CHAETOMITRIUM PAPILLIFOLIUM Bryol. jav.

MINDANAO, Subprovince of Butuan, on trees, altitude 8 m, *Weber 1498.*

Area: Ceylon, Java, and the Andaman Islands.

CHAETOMITRIUM PHILIPPINENSE (Mont.) Bryol. jav.

MINDANAO, Subprovince of Butuan, on *Ficus* trees, altitude 6–15 m, *Weber 1292, 1306.*

Area: Java, Ceram, Philippines.

CHAETOMITRIUM WARBURGII Broth.

MINDANAO, Subprovince of Butuan, on tree trunks and branches, altitude 15 m, *Weber 1323.* POLILLO, *Bur. Sci. 10513 McGregor.*

Area: Philippines.

CHAETOMITRIUM SERIATUM Broth.

MINDANAO, Subprovince of Butuan, on trees in forests, altitude 8 m, *Weber 1496.*

Area: Borneo and Philippines.

CHAETOMITRIUM WEBERI Broth. sp. nov.

Dioicum; robustiusculum, caespitosum, caespitibus laxis, laete viridibus, nitidiusculis; *caulis* elongatus, repens, per totam longitudinem fusco-radiculosus, laxiuscule foliosus, dense ramosus, ramis vix ultra 5 mm longis, subaequilongis, erectis vel suberectis, strictis, densiuscule et complanate foliosis, simplicibus, obtusis; *folia ramea* concava, laevia, lateralia patula, oblonga, infra apicem breviter lanceolatum contracta, marginibus denticulatis, inferne anguste recurvis, superne parce undulatis, nervis

binis, brevibus, cellulis angustissimis, papilla apicali, acuta instructis, ventralia et dorsalia minora, erectiora, caulina longius acuminata. Caetera ignota.

MINDANAO, Subprovince of Butuan, on *Ficus* tree, altitude 6 m, *Weber 1309*.

Species cum *C. Geheebii* Broth. comparanda.

HYPOPTERYGIACEAE

LOPIDIUM Hooker filius et Wilson

LOPIDIUM JAVANICUM Hamp. forma **ACUTIFOLIUM** Fleisch.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 1,600 m, *Bur. Sci. 9804 Robinson.*

Area: Java and Mindanao.

HYPOPTERYGIUM Bridel

HYPOPTERYGIUM CEYLANICUM Mitt.

LUZON, Subprovince of Bontoc, *Vanoverbergh 767*.

Area: Ceylon, Sumatra, Java, and New Guinea.

HYPOPTERYGIUM VRIESEI Bryol. jav.

LUZON, Province of Tayabas, Siniloan trail, *Bur. Sci. 9477 Robinson.*

Area: Sumatra, Java, Ceram, and New Guinea.

CYATHOPHORELLA Fleischer

CYATHOPHORELLA ADIANTHOIDES Broth. sp. nov.

Dioica; robustiuscula, rigida, saturate viridis, opaca; *caulis primarius* longiusculus, fusco-tomentosus; *caules secundarii* numerosi, usque ad 6 cm longi, laxissime foliosi, ob folia superiora sensim minora caudatae, simplices; *folia* difficiliter emollita, media maxima, horizontalia, asymmetrica, ovato-oblonga, sensim breviter subulata, usque ad 7 mm longa et vix ultra 2 mm lata, superne aculeato-serrata, dentibus singulis e cellulis pluribus constructis, nervo brevi, saepe furcato, cellulis laxis, ovali- vel oblongo-hexagonis, marginalibus angustis, limbum uniseriatum, lutescentem efformantibus; amphigastria symmetrica rotundato-ovalia, raptim breviter lanceolato-subulata, superne parce serrata, dentibus semper unicellularibus, nervis brevissimis, inaequalibus. Caetera ignota.

LUZON, Province of Rizal, on branches of trees, *Bur. Sci. 13642 Ramos.*

Species cum *C. Adiantho* (Griff.) et *C. spinosa* (C. Müll.) comparanda, ab hac statura multo robustiore, foliorum amphigastriorumque forma, ab illa foliorum forma amphigastriisque brevius latiusque acuminatis, superne parcius et minutius serratis dignoscenda.

LESKEACEAE

PELEKIUM Mitten

PELEKIUM VELATUM Mitt.

LUZON, Province of Rizal, on dead tree, *Bur. Sci. 13644 Ramos:* Province of Laguna, *Bur. Sci. 9672 Robinson;* Calauan, *Bur. Sci. 12514 McGregor:* Subprovince of Benguet, Sablang, *Bur. Sci. 12803 Fénix.* MINDANAO, Subprovince of Butuan, on bark of a prostrate tree, altitude 7 m, *Weber 1307, 1497, 1500.* POLILLO, *Bur. Sci. 6852 Robinson, Bur. Sci. 10506 McGregor.* LUMBUCAN ISLAND, (Sulu Sea), *Merrill 7196.*

THUIDIUM Bryol. eur.

THUIDIUM CYMBIFOLIUM (Doz. et Molk.) Bryol. jav.

LUZON, Subprovince of Benguet, Baguio and vicinity, on trees, altitude about 1440 m, *Bur. Sci. 14022 Robinson;* Sablang, *Bur. Sci. 12941, 12804 Fénix:* Province of Laguna, Mount Banajao, altitude 1,500 m, *Bur. Sci. 9855 Robinson:* Subprovince of Bontoc, on trees, altitude about 1,300 m, *Vanoverbergh 961, 1264.*

THUIDIUM PLUMULOSUM (Doz. et Molk.) Bryol. jav.

LUZON, Province of Laguna, on rocks, altitude 80 m, *Bur. Sci. 9661 Robinson:* Province of Tayabas, Tagcauayan, *Bur. Sci. 13098 Foxworthy & Ramos.*

HYPNACEAE

CAMPYLIUM (Sull.) Bryhn

CAMPYLIUM GLAUCOCARPUM (Reinw.) Broth.

LUZON, Subprovince of Benguet, on trees, altitude about 1,500 m, *Merrill 7840:* Subprovince of Bontoc, on trees, altitude about 1,650 m, *Vanoverbergh 891, 1162.*

CTENIDIUM (Schimp.) Mitten

CTENIDIUM LUZONENSE Broth. sp. nov.

Dioicum; tenellum, caespitosum, caespitibus densis, mollibus, lutescenti-viridibus, sericeo-nitidis; *caulis* elongatus, repens, per totam longitudinem hic illic fasciculatim fusco-radiculosus, densissime ramosus, ramis erectis, vix ultra 4 mm longis, dense foliosis, simplicibus; *folia ramea* erecto-patentia, e basi cordata lanceolato-subulata longe filiformiter attenuata, marginibus erectis basi minute dein argute serratis, enervia, cellulis angustissime linearibus, flexuosulis, laevissimis; *bracteae perichaetii* e basi vaginante raptim subulatae, filiformiter attenuatae, ad apicem partis vaginantis profunde incisae, laxe reticulatae; *seta* 1.5–2 cm alta, flexuosula, rubra, laevissima; *theca* (junior) subhorizontalis, oblonga, arcuatula, fuscidula; *operculum* alte conicum, acutum. *Calyptra* ignota.

LUZON, Province of Laguna, Mount Banajao, *Bur. Sci. 6605 Robinson.*

Species e tenerrimis, foliis erecto-patentibus, longe filiformiter attenuatis, cellulis laevissimis dignoscenda.

ELMERIOBRYUM Brotherus

ELMERIOBRYUM PHILIPPINENSE Broth.

LUZON, Subprovince of Benguet, *Bur. Sci. 12943 Fénix;* on damp banks, altitude about 2,000 m, *Merrill 7835;* open ridges, on limestone boulders, altitude about 1,600 m, *Merrill 7842;* Baguio and vicinity, *Bur. Sci. 11999 Robinson:* Subprovince of Bontoc, on wet soil, altitude 1,650 m, *Vanoverbergh 1318;* hillsides, altitude 1,200 m, *Vanoverbergh 598.*

Area: Philippines.

ECTROPOTHECIUM Mitten

ECTROPOTHECIUM VERRUCOSUM (Hamp.) Jaeg.

LUZON, Subprovince of Benguet, Lutab to Cabayan, *Bur. Sci. 8789 McGregor:* Province of Laguna, *Bur. Sci. 9673 Robinson:* Province of Union, Bauang, *Bur. Sci. 12989 Fénix.* NEGROS, Canlaon Volcano, on trees, altitude about 2,000 m, *Merrill 6825.*

Area: Sumatra, Java, and New Caledonia.

ECTROPOTHECIUM MONUMENTORUM (Dub.) Jaeg.

LUMBUCAN ISLAND, (Sulu Sea), on rotten log in forests, *Merrill 7197, 7194.*

Area: Sumatra, Java, and Borneo.

ECTROPOTHECIUM ASSIMILE Broth.

LUZON, Subprovince of Benguet, Sablang, *Bur. Sci. 12797 Fénix:* Province of Rizal, Montalban, on rocks, altitude 30 m, *Bur. Sci. 9654 Robinson.* MINDANAO, Subprovince of Bukidnon, on rotten log, altitude 575 m, *Weber 1507:* Subprovince of Butuan, *Weber 1501.*

ECTROPOTHECIUM MICROPYXIS Broth.

MINDANAO, Subprovince of Butuan, *Weber 1499.*

ECTROPOTHECIUM ELEGANTI-PINNATUM (C. Müll.) Jaeg.

LUZON, Subprovince of Benguet, Mount Tonglon, altitude about 2,000 m, *Merrill 7846.*

Area: Philippines.

ECTROPOTHECIUM LUZONIAE (C. Müll.) Jaeg.

LUZON, Subprovince of Benguet, Baguio and vicinity, on trees, altitude about 1,450 m, *Bur. Sci. 14017, 14016 Robinson.*

ECTROPOTHECIUM SUBINTORQUATUM Broth.

LUZON, Province of Laguna, *For. Bur. 19126 Tamesis:* Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1276:* Subprovince of Lepanto, Malaya Mountains, *Bona 152.* MINDANAO, District of Zamboanga, on trees, altitude about 1,000 m, *Merrill 8358.* NEGROS, Canlaon Volcano, on prostrate logs in forests, altitude about 1,100 m, *Merrill 6803.*

STEREODON (Brid.) Mitten

STEREODON LUZONENSIS Broth.

LUZON, Subprovince of Benguet, Mount Tonglon, on prostrate logs, altitude about 1,800 m, *Merrill 7858:* Subprovince of Bontoc, *Vanoverbergh 783.*

TRISMEGISTIA (C. Müll.) Brotherus

TRISMEGISTIA LANCIFOLIA (C. Müll.) Broth.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 12095, 12096 Ramos;* Paeté, *Bur. Sci. 10061 Ramos;* Mount Banajao, on ground, altitude 1,500 m, *Bur. Sci. 9794 Robinson:* Province of Rizal, San Isidro, on trees, *Bur. Sci. 13442, 13447 Ramos.* MINDANAO, Subprovince of Butuan, altitude 122 m, *Weber 1293, 1296.* NEGROS, Mount Marapara, *For. Bur. 13647 p. p. Curran & Foxworthy.* POLILLO, *Bur. Sci. 10517, 10519 McGregor, Bur. Sci. 9107, 9200 Robinson.*

TRISMEGISTIA KORTHALSII (C. Müll.) Broth.

LUZON, Province of Laguna, *Calvin 331.*

MASTOPOMA Cardot

MASTOPOMA UNCINIFOLIUM (Broth.) Card.

NEGROS, Mount Marapara, *For. Bur. 13647 p. p. Curran & Foxworthy.*
Area: Mindanao.

ISOPTERYGIUM Mitten

ISOPTERYGIUM ALBESCENS (Schwaegr.) Jaeg.

LUZON, Subprovince of Benguet, *Bur. Sci. 12938 Fénix.* NEGROS, Canlaon Volcano, on trees, altitude about 2,000 m, *Merrill 6818.*

PLAGIOTHECIUM Bryol. eur.

PLAGIOTHECIUM MIQUELII (Bryol. jav.) Broth.

LUZON, Province of Cagayan, *For. Bur. 16645 Curran.* POLILLO, *Bur. Sci. 10512, 10520 McGregor.*

PLAGIOTHECIOPSIS Brotherus genus novum

PLAGIOTHECIOPSIS PHILIPPINENSIS Broth. sp. nov.

Autoicum; robustiusculum, caespitosum, caespitibus laxiusculis, mollibus, viridibus, nitidiusculis; *caulis* elongatus, repens, per totam longitudinem hic illic fasciculatim fusco-radiculosus, dense et complanate foliosus, dense pinnatim ramosus, ramis patulis, valde complanatis, dense foliosis, plerumque brevibus, vix ultra 5 mm longis, simplicibus, singulis longioribus, pinnatim ramulosis; *folia lateralia* patula, concava, ovalia, apiculata, apice denticulata, dorsalia et ventralia minora et angustiora, breviter lanceolato-acuminata, enervia, cellulis laxis, superioribus ovalihexagonis, dein sensim longioribus; *bracteae perichaetii* internae erectae, e basi semivaginante sensim longe lanceolato-acuminatae, subintegrae; *seta* 1.2–2 cm alta, tenuis, flexuosula, rubra; *theca* suberecta vel inclinata, paulum asymmetrica, cylindracea, brevicollis, leptodermis, pallide fuscidula; *annulus* angustus; *exostomii* dentes sicci e basi reflexa circinato-incurvi, anguste lanceolato-subulati, c. 0.55 mm longi et c. 0.05 mm lati, lutei,

albide limbati, basi dense transverse striolati, dein minute papillosi, dense lamellati; *endostomium* fusco-luteum, minute papillosum; *corona basilaris* c. 0.010 mm alta; *processus* dentium longitudinis, angusti, carinati, saepe divisi, cruribus divergentibus; *cilia* 0; *spori* 0.010–0.015 mm, virides, laeves; *operculum* e basi alte conica breviter et oblique rostratum.

MINDANAO, District of Davao, on trees, altitude 120 m, *Weber 1479.*

Genus novum inter *Plagiothecium* et *Vesiculariam* ponendum, ab ambobus peristomii structura omnino diversum.

VESICULARIA (C. Müll.) C. Müller

VESICULARIA RETICULATA (Doz. et Molk.) Broth.

LUZON, Province of Cagayan, Abulug River, on rotten logs, altitude about 15 m, *Weber 1591.*

Area: Nepal, Sikkim, Khasia, Sumatra, Java, and Celebes.

VESICULARIA CAMPYLOTHECIUM (Broth.) Broth.

LUZON, Subprovince of Benguet, on rocks in small clear streams, submerged, altitude about 1,500 m, *Merrill 7854:* Province of Laguna, Calauan, *Bur. Sci. 12518 McGregor:* Province of Union, Bauang, *Bur. Sci. 12988 Fénix.*

VESICULARIA MEYENIANA (Hamp.) Broth.

LUZON, Province of Laguna, Los Baños, on damp rocks, *Bur. Sci. 9890 Robinson;* Calauan, *Bur. Sci. 12515 McGregor:* Province of Tayabas, Infanta, *Bur. Sci. 9324 Robinson;* Cabibihan, *Bur. Sci. 13150 Foxworthy & Ramos:* Province of Rizal, Tanay, on wet rocks, *Bur. Sci. 11879 Robinson & Ramos:* Province of Cagayan, *Bur. Sci. 7578 Ramos.* MINDANAO, Subprovince of Butuan, on damp rocks, *Weber 1497 p. p.* LEYTE, Malitbog, on damp rocks, altitude 70 m, *Weber 1528.*

VESICULARIA DUBYANA (C. Müll.) Broth.

MINDANAO, Subprovince of Butuan, on damp clay bank, altitude 10 m, *Weber 1288.*

Area: Java, Banca, Amboina, Aru.

VESICULARIA FILICUSPES Broth. sp. nov.

Autoica; caespitosa, caespitibus laxis, depressis, lutescentibus, nitidiusculis; *caulis* elongatus, repens, per totam longitudinem hic illic fasciculatim fusco-radiculosus, laxiuscule foliosus, dense et regulariter pinnatim ramosus, ramis patulis, aequilongis, vix ultra 5 mm longis, dense et complanate foliosis, simplicibus, obtusis; *folia* sicca vix mutata, falcatula, concava; *caulina* e basi ovali sensim lanceolata, in acumen longissimum, piliforme attenuata, marginibus erectis vel inferne angustissime recurvis, integris vel subintegris, enervia, cellulis teneris, elongate rhomboideis (5:1 usque ad 7:1), basilaribus infimis laxis, abbreviatis;

folia ramea eisdem caulinis similia, sed brevius piliferis, marginibus superne distincte serrulatis. Caetera ignota.

LUZON, Province of Tayabas, Tagcauayan, on trunks of trees, *Bur. Sci. 13100 Foxworthy & Ramos.*

Species *V. pilireti* (Broth.) Broth. affinis, sed foliis falcatulis foliisque longissime piliferis raptim dignoscenda.

VESICULARIA SPLENDIDA Broth. sp. nov.

Autoica; robustiuscula, caespitosa, caespitibus laxis, lutescenti-viridibus, nitidis; *caulis* elongatus repens, per totam longitudinem hic illic fasciculatim fusco-radiculosus, laxiuscule et valde complanate foliosus, laxe et irregulariter pinnatim ramosus, ramis inaequilongis, usque ad 1.5 cm longis, valde complanatis, laxiuscule foliosis, simplicibus, obtusis; *folia caulina* lateralia patentia, asymmetrica, ovalia breviter lanceolato-subulata, marginibus erectis, superne minutissime serrulatis, enervia, cellulis teneris, elongate rhomboideis (6:1 usque ad 10:1), parce chlorophyllosis, *ventralia* et *dorsalia* erectiora, subsymmetrica; *folia ramea* eisdem caulinis similia. Caetera ignota.

LUZON, Province of Rizal, Antipolo, *Bur. Sci. 11875 Robinson & Ramos.*

Species pulchra, *V. campylothecio* affinis, sed nitore, statura robustiore foliisque angustius reticulatis dignoscenda.

TAXITHELIUM Spruce

TAXITHELIUM INSTRATUM (Brid.) Broth.

LUZON, Province of Rizal, on dead tree, *Bur. Sci. 13643 Ramos.* POLILLO, *Bur. Sci. 10521 McGregor.* LUMBUCAN ISLAND, (Sulu Sea), *Merrill 7193.*

TAXITHELIUM NEPALENSE (Schwaegr.) Broth.

MINDANAO, Subprovince of Butuan, on decaying prostrate tree, altitude 10 m, *Weber 1325.*

Area: Nepal, Bengal, Ceylon, Java, Borneo, and Amboina.

TAXITHELIUM (POLYSTIGMA VERA) PERCAPILLIPES Broth. sp. nov.

Autoicum; robustiusculum, pallide lutescenti-viride, opacum; *caulis* elongatus, repens, per totam longitudinem substrato affixus, laxiuscule foliosus, dense pinnatim ramosus, ramis patulis, vix ultra 1 cm longis, laxiuscule foliosis, complanatis, simplicibus, obtusis; *folia lateralia* patentia, cochleariformi-concava, e basi contracta ovalia, apiculata, marginibus erectis, superne minutissime denticulatis, enervia, cellulis angustissime linearibus, dense et seriatim papillosis, basilaribus brevioribus et latioribus, laevibus, alaribus magnis, oblongis, vesicularibus, hyalinis; *bracteae perichaetii* internae erectae, e basi vaginante

sensim longe lanceolato-subulatae, superne denticulatae; *seta* usque ad 2 cm alta, tenuissima, rubra, laevissima; *theca* erecta vel suberecta, minutissima, ovalis, sicca deoperculata sub ore valde constricta, fusca; *operculum* conicum, apiculatum.

POLILLO, on branches of trees, *Bur. Sci. 6885 Robinson.*

Species *T. instrato* affinis, sed statura robustiore, foliis laxioribus, ovalibus, apiculatis, necnon theca minutissima, erecta vel suberecta optime diversa.

TAXITHELIUM (POLYSTIGMA APTERA) BENGUETIAE Broth. sp. nov.

Autoicum; tenerrimum, caespitosum, caespitibus densis, mollibus, pallide lutescentibus, nitidiusculis; *caulis* elongatus, repens, hic illic fasciculatim fusco-radiculosus, dense ramosus, ramis suberectis, densiuscule foliosis, brevibus, vix ultra 5 mm longis, vel longioribus, subpinnatim ramulosis; *folia* falcatula, concaviuscula, ovato-lanceolata, breviter subulato-acuminata, marginibus erectis, superne minutissime serrulatis vel subintegris, enervia, cellulis angustissimis, tenerrime seriatim papillosis, basilaribus infimis abbreviatis, luteis, alaribus vesiculosis paucissimis, minutis, hyalinis, supra alaribus, minutis, subquadratis; *bracteae perichaetii* internae e basi vaginante sensim longissime subulatae, superne serrulatae; *seta* usque ad 1 cm alta, tenuissima, flexuosula, rubra, laevissima; *theca* inclinata, minutissima, asymmetrica, sicca deoperculata sub ore constricta, fuscidula; *operculum* ignotum.

LUZON, Province of Benguet, on tree trunks, *Sanchez 10.*

Species pulchella, teneritate omnium partium, foliis falcatulis, cellulis alaribus vesiculosis paucissimis, hyalinis faciliter dignoscenda.

TAXITHELIUM (POLYSTIGMA APTERA) HORRIDULUM Broth. sp. nov.

Autoicum; tenellum, caespitosum, caespitibus densis, lutescentibus, subopacis; *caulis* elongatus, repens, per totam longitudinem substrato affixus, laxiuscule foliosus, dense pinnatim ramosus, ramis patulis, vix ultra 3 mm longis, complanatulis, laxiuscule foliosis, simplicibus, obtusis; *folia lateralia* horride patula, concava, e basi plerumque contracta oblongo-lanceolata, subulato-acuminata, marginibus erectis, integris, enervia, cellulis anguste linearibus, distincte seriatim papillosis, alaribus paucis, minutis, quadratis; *bracteae perichaetii* internae e basi vaginante longe subulatae, integrae vel subintegrae; *seta* c. 5 mm alta, tenuissima, rubra, laevissima; *theca* suberecta, minutissima, ovalis, fusca; *operculum* ignotum.

LUZON, Province of Laguna, Mount Banajao, on dead trees, altitude 800 m, *Bur. Sci. 9773 Robinson.*

Species tenella, foliis horride patulis oculo nudo jam dignoscenda.

TAXITHELIUM (POLYSTIGMA APTERA) RAMICOLA Broth. sp. nov.

Autoicum; tenellum, caespitosum, caespitibus laxis, pallide lutescentibus, nitidis; *caulis* elongatus, repens, per totam longitudinem substrato affixus, laxiuscule foliosus, pinnatim ramosus, ramis patentibus, plerumque vix ultra 6 mm longis, singulis longioribus, pinnatim ramulosis, ramis et ramulis densiuscule foliosis, valde complanatis, cum foliis c. 2 mm latis, obtusis; *folia lateralia* patentia, concava, a basi contracta lanceolata, sensim breviter et anguste acuminata, marginibus erectis, integerrimis, enervia, cellulis anguste linearibus, distincte seriatim papillosis, alaribus paucis, parvis; *bracteae perichaetii* internae erectae, e basi vaginante longe subulatae, superne minutissime serrulatae; *seta* vix ultra 8 mm alta, tenuissima, flexuosula, lutescenti-rubra, laevissima; *theca* suberecta, minutissima, ovalis, sicca deoperculata sub ore constricta, fusca; *operculum* ignotum.

POLILLO, on branches of trees, *Bur. Sci. 10509 McGregor.*

Species *T. Lindbergii* (Bryol. jav.) valde affinis sed statura robustiore foliisque angustioribus dignoscenda.

TAXITHELIUM LINDBERGII (Bryol. jav.) Ren. et Card.

Luzon, Subprovince of Bontoc, on trees, altitude 1650 m, *Vanoverbergh 1277.*

Area: Java, Borneo, Ceram, and Saperoa.

TAXITHELIUM ALARE Broth.

LUZON, Province of Laguna, Mount Banajao, on dead trees, altitude 800 m, *Bur. Sci. 9772 Robinson.*

TAXITHELIUM PAPILLATUM (Harv.) Broth.

LUZON, Province of Tayabas, Tagcauayan, *Bur. Sci. 13099 Foxworthy & Ramos:* Province of Cagayan, *Bur. Sci. 14585 Ramos.*

LEUCOMIACEAE

LEUCOMIUM Mitten

LEUCOMIUM PHILIPPINENSE Broth. sp. nov.

Dioicum; gracilescens, caespitosum, caespitibus densiusculis, depressis, mollibus, pallide viridibus, nitidis; *caulis* elongatus, repens, per totam longitudinem hic illic fusco-radiculosus, valde ramosus, ramis subpinnatim ramulosis, ramis et ramulis valde complanatis, densiuscule foliosis, obtusis; *folia* sicca vix mutata, concaviuscula, lateralia patentia, ovato-lanceolata, sensim longe filiformi-attenuata, marginibus erectis, integerrimis, enervia, cellulis laxis, tenerrimis, elongate rhombeis vel hexagonis, subinanibus; *seta* c. 1 cm alta, tenuis, flexuosula, rubra, apice parce

et indistincte scaberula; *theca* horizontalis, oblonga, crassicollis, fusca; *operculum* e basi convexo-conica longe aciculare.

LUZON, Province of Laguna, Calauan, *Bur. Sci. 12517 McGregor.*

Species *L. aneurodictyo* (C. Müll.) Jaeg. affinis, sed foliis vix contractis, longius acuminatis dignoscenda.

SEMATOPHYLLACEAE

MEIOTHECIUM Mitten

MEIOTHECIUM MICROCARPUM (Harv.) Mitt.

MINDANAO, District of Cotabato, *Bur. Sci. 11706 Robinson.*

Area: Nepal, Ceylon, Sumatra, Banca, Java, Amboina, Borneo, and New Guinea.

MEIOTHECIUM JAGORI (C. Müll.) Broth.

POLILLO, *Bur. Sci. 9076 Robinson.*

Area: Ceylon, Malacca, Java, Amboina, and Celebes.

MEIOTHECIUM ATTENUATUM Broth. sp. nov.

Species robusta, *M. microcarpo* valde affinis, sed foliis raptim anguste lanceolato-acuminatis dignoscenda.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 12094 Ramos:* Subprovince of Benguet, in ravines, on branches of trees, altitude about 1,500 m, *Merrill 7832* (*f. robusta*).

RHAPHIDOSTEGIUM (Bryol. eur.) De Notaris

RHAPHIDOSTEGIUM SAPROXYLOPHILUM (C. Müll.) Jaeg.

LUZON, Province of Laguna, Calauan, *Bur. Sci. 12516 McGregor:* Province of Rizal, Mount Canumay, on bamboo, *Bur. Sci. 13797 Ramos.* MINDANAO, District of Davao, on bamboo, altitude 550 m, *Weber 1478.*

Area: Java.

RHAPHIDOSTEGIUM MICROCLADIOIDES Broth. sp. nov.

Autoicum; tenellum, caespitosum, caespitibus densis, lutescentibus, nitidis; *caulis* elongatus, repens, per totam longitudinem dense fusco-radiculosus, densissime ramosus, ramis adscendentibus vel erectis, vix ultra 5 mm longis, dense foliosis, complanatulis, simplicibus, obtusis; *folia ramea* erecto-patentia, concaviuscula, e basi ovali vel oblonga lanceolato-subulata, marginibus latiuscule recurvis, integris vel apice minutissime denticulatis, enervia, cellulis incrassatis, lumine angustissime lineari, basilaribus luteis, alaribus magnis, oblongis, vesiculosis, hyalinis, omnibus laevissimis; *bracteae perichaetii* internae erectae, e basi vaginante sensim breviter lanceolato-subulatae, marginibus superne argute denticulatis; *seta* usque ad 2 cm alta, tenuis, flexuosula, rubra, apice mammillis humillimis latis luteis instructa; *theca* horizontalis ovalis, brevicollis, castanea; *operculum* ignotum.

MINDANAO, Subprovince of Butuan, on tree trunks, altitude 396 m, *Weber 1312.*

Species cum *R. microclado* (Doz. et Molk.) Broth. comparanda.

RHAPHIDOSTEGIUM TRISTICULUM (Mitt.) Jaeg.

LUZON, Subprovince of Benguet, *Sanchez 6, For. Bur. 15639 Curran;* Baguio and vicinity, altitude about 1,450 m, *Bur. Sci. 14053 Robinson.*

Area: Khasia, Assam, Annam, Tonkin, Coorg, Ceylon, Sumatra, Java.

WARBURGIELLA C. Müller

WARBURGIELLA CUPRESSINOIDES C. Müll.

LUZON, Subprovince of Benguet, Mount Pulog, *For. Bur. 16413 Curran, Merritt, & Zschokke.*

Area: Mindanao and Batjan.

TRICHOSTELEUM (Mitt.) Jaeger

TRICHOSTELEUM HAMATUM (Doz. et Molk.) Jaeg.

LUZON, Province of Laguna, Mount Banajao, on dead wood, altitude 1,600-2,000 m, *Bur. Sci. 9801, 9802, 9825 Robinson.* MINDANAO, District of Zamboanga, on prostrate logs, altitude about 1,000 m, *Merrill 8356.*

TRICHOSTELEUM CYLINDRICUM (Reinw. et Hornsch.) Broth.

LUZON, Subprovince of Benguet, Mount Tonglon, on prostrate logs, altitude about 2,000 m, *Merrill 7822, 7863.*

TRICHOSTELEUM (RHAPHIDOSTEGIOPSIS) BREVISETUM Broth. sp. nov.

Autoicum; tenellum, caespitosum, caespitibus densis, mollibus, lutescenti-viridibus, opacis; *caulis* elongatus, repens, per totam longitudinem dense fusco-radiculosus, dense ramosus, ramis vix ultra 3 mm longis, suberectis, dense foliosis, simplicibus; *folia ramea* falcatula, canaliculato-concava, oblongo-lanceolata, raptim in acumen elongatum, filiforme attenuata, marginibus subconniventibus, e medio ad apicem serrulatis, enervia, cellulis haud incrassatis, anguste rhomboideis, superioribus papilla media majuscula instructis, basilaribus luteis, alaribus magnis, oblongis, vesiculosis; *bracteae perichaetii* internae e basi late vaginante raptim in acumen reflexum, filiforme, serrulatum attenuatae, ad apicem partis vaginantis utrinque profunde incisae; *seta* 1 cm vel paulum ultra alta, tenuissima, flexuosula, rubra, laevissima; *theca* horizontalis, minuta, ovalis, sicca deoperculata, sub ore constricta, fusca; *operculum* ignotum.

LUZON, Subprovince of Bontoc, on trees, altitude 1,650 m, *Vanoverbergh 1314.*

Species praecedenti affinis, sed statura multo teneriore nec non seta brevi oculo nudo jam dignoscenda.

TRICHOSTELEUM (PAPILLIDIUM) MINDANENSE Broth. sp. nov.

Autoicum; tenellum, caespitosum, caespitibus densis, depressis, lutescenti-viridibus, opacis; *caulis* elongatus, repens, per totam longitudinem dense fusco-radiculosus, dense pinnatim ramosus, ramis patulis, vix ultra 5 mm longis, dense et complanate foliosis, simplicibus, obtusis; *folia* patentia, concava, e basi contracta oblongo-elliptica, sensim lanceolato-acuminata vel acumine breviter subulato, marginibus erectis, superne serrulatis, enervia, cellulis anguste ellipticis, papilla media, alta instructis, alaribus magnis, oblongis, vesiculosis, hyalinis vel luteis; *bracteae perichaetii* internae e basi vaginante raptim longe subulatae, ad apicem partis vaginantis utrinque incisae, subula serrulata; *seta* vix ultra 8 mm alta, tenuissima, flexuosula, rubra, apice scaberrima; *theca* nutans, minutissima, ovalis, grosse mammillosa, atropurpurea, sicca deoperculata, sub ore haud constricta; *operculum* ignotum.

MINDANAO, District of Zamboanga, *Merrill 8355.*
Species cum *T. mammoso* (C. Müll.) Jaeg. comparanda.

SEMATOPHYLLUM (Bryol. jav.) Jaeger

SEMATOPHYLLUM GRACILICAULE (Bryol. jav.) Jaeg.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9410 Robinson.*
Area: Java.

SEMATOPHYLLUM SUBULATUM (Hamp.) Jaeg.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9437 Robinson.*

SEMATOPHYLLUM (ACROPORIUM) TUBULOSUM Broth. sp. nov.

Dioicum; gracilescens, caespitosum, caespitibus densis, rigidis, fusco-aureis, nitidis; *caulis* longiusculus, procumbens, fragilis, vix radiculosus, densiuscule foliosus, plus minusve ramosus, ramis patentibus, cuspidatis, brevibus, simplicibus, vel longioribus et ramulosis; *folia* sicca et humida horride patula, tubulosa, anguste lanceolato-subulata, c. 3 mm longa, marginibus in parte subulata conniventibus, summo apice dentibus paucis instructis, enervia, cellulis angustissime linearibus, laevissimis, alaribus pluribus, magnis, oblongis, vesiculosis, fuscis; *seta* c. 2 cm alta, tenuis, rubra, laevis; *theca* inclinata, minutissima, paulum asymmetrica, ovalis, fusca. Caetera ignota.

NEGROS, Canlaon Volcano, on trees, altitude about 2,000 m, *Merrill 6819, 6826.*

Species pulchra, *S. Braunii* (C. Müll.) forsan proxima, sed statura robustiore foliisque horride patulis, angustioribus, longius subulatis oculo nudo jam dignoscenda.

SEMATOPHYLLUM BRAUNII (C. Müll.) Jaeg.

LUZON, Province of Laguna, Mount Banajao, on dead logs, altitude about 1,700 m, *Bur. Sci. 9810 Robinson.*

Area: Sumatra, Java, Borneo, and Celebes.

SEMATOPHYLLUM (ACROPORIUM) BREVIPES Broth. sp. nov.

Autoicum; gracilescens, caespitosum, caespitibus densis, depressis, lutescenti-viridibus, nitidis; *caulis* elongatus, repens, valde ramosus et ramulosus, ramis adscendentibus, dense foliosis, breviter cuspidatis; *folia* erecto-patentia, concava, ovato-lanceolata, breviter acuminata, marginibus superne subconniventibus, integris, enervia, cellulis angustissime linearibus, laevissimis, alaribus pluribus, magnis, oblongis, vesiculosis, fuscis; *bracteae perichaetii* internae erectae, e basi late vaginante subito breviter subulatae, subula minute serrulata; *seta* 8–10 mm, tenuissima, rubra, superne mammillis humillimis, latis luteis, obtecta; *theca* suberecta, breviter oblonga, brevicollis; *operculum* e basi conica rostratum, rostro aciculari, thecam longitudine superante.

LUZON, Subprovince of Benguet, on ledges in small streams, more or less submerged, altitude about 1,500 m, *Merrill 7865.*

Species a congeneribus autoicis seta brevi raptim dignoscenda.

SEMATOPHYLLUM (ACROPORIUM) ROBINSONII Broth. sp. nov.

Autoicum; gracilescens, caespitosum, caespitibus densis, depressis, lutescenti-viridibus, nitidis; *caulis* elongatus, repens, valde ramosus et ramulosus, ramis complanatulis dense foliosis, cuspidatis; *folia* erecto-patentia, comalia ramulina subsecundula, concava, ovato-lanceolata, subulato-acuminata, marginibus superne conniventibus, integris, enervia, cellulis angustissime linearibus, laevissimis, alaribus pluribus, magnis, oblongis, vesiculosis, fusco-aureis; *bracteae perichaetii* internae erectae, e basi late vaginante subito breviter subulatae, subula minute serrulata; *seta* c. 10 mm alta, tenuissima, rubra, e medio ad apicem scabra. Caetera ignota.

LUZON, Province of Laguna, Mount Banajao, on dead trees, altitude 1,600 m, *Bur. Sci. 9800 Robinson.*

Species praecedenti affinis, sed foliorum forma necnon seta superne scabra optime diversa.

SEMATOPHYLLUM ALTO-PUNGENS (C. Müll.) Jaeg.

LUZON, Province of Laguna, Mount Banajao, *Bur. Sci. 9826 p. p. Robinson.* NEGROS, Canlaon Volcano, on trees, altitude about 2,000 m, *Merrill 6807, 6811, 6824.*

SEMATOPHYLLUM HYALINUM (Reinw.) Jaeg.

NEGROS, Mount Marapara, *For. Bur. 13646 Curran & Foxworthy.*
Area: Sumatra, Java, Banca, Borneo, Celebes, and the Philippines.

SEMATOPHYLLUM HERMAPHRODITUM (C. Müll.) Besch.

LUZON, Province of Laguna, Mount Banajao, *Copeland.*
Area: Sumatra, Java, Celebes, and New Guinea.

SEMATOPHYLLUM (ACROPORIUM) BATANENSE Broth. sp. nov.

Phyllautoicum; gracilescens, caespitosum, caespitibus densis, lutescenti-viridibus, nitidis; *caulis* repens, dense ramosus et ramulosus, ramis dense foliosis, breviter cuspidatis; *folia* patula, concava, ovato-lanceolata, breviter et anguste acuminata, marginibus superne subconniventibus, integris, enervia, cellulis angustissime linearibus, laevissimis, alaribus pluribus, magnis, oblongis, vesiculosis, fuscis; *bracteae perichaetii* internae erectae, a basi late vaginante raptim subulatae, subula argute serrata; *seta* c. 18 mm alta, tenuissima, rubra, superne scabra; *theca* subhorizontalis, ovalis, brevicollis, sicca deoperculata sub ore constricta, fusca; *operculum* ignotum.

BATANES ISLANDS, *Bur. Sci. 3856 Fénix.*

SEMATOPHYLLUM FALCIFOLIUM Fleisch.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9374 Robinson.*

SEMATOPHYLLUM PILIFERUM Broth.

LUZON, Province of Laguna, Mount Banajao, on trees, altitude 2,200 m, *Bur. Sci. 9826 Robinson.*

PILOECIUM C. Müller

PILOECIUM PSEUDORUFESCENS (Hamp.) C. Müll.

MINDANAO, Subprovince of Butuan, on tree trunks, altitude 137 m, *Weber 1330.*

Area: Malacca, Sumatra, Philippines, and New Guinea.

BRACHYTHECIACEAE

PLEUROPUS Griffith

PLEUROPUS LUZONENSIS Broth.

LUZON, Subprovince of Benguet, altitude about 1,550 m, *Merrill 7861, Bur. Sci. 12942 Fénix;* Baguio and vicinity, on trees, altitude about 1,440 m, *Bur. Sci. 14020 Robinson.*

Area: Luzon.

BRACHYTHECIUM Bryol. eur.

BRACHYTHECIUM OXYRRHYNCHUM (Doz. et Molk.) Jaeg.

LUZON, Province of Laguna, Mount Banajao, on rocks, altitude 800 m, *Bur. Sci. 9780 Robinson.* NEGROS, Canlaon Volcano, on earth, altitude about 2,000 m, *Merrill 8623.*

Area: Java.

RHYNCHOSTEGIUM Bryol. eur.

RHYNCHOSTEGIUM MENADENSE (Bryol. jav.) Jaeg.

LUZON, Province of Tayabas, near Lucban, on trees, altitude 350 m, *Bur. Sci. 9711 Robinson.*

Area: Celebes and Tonkin.

RHYNCHOSTEGIUM CELEBICUM (Bryol. jav.) Jaeg.

MINDANAO, District of Davao, on trees, altitude 550 m, *Weber 1477.*

Area: Celebes and Tonkin.

RHACOPILACEAE

RHACOPILUM Palisot de Beauvois

RHACOPILUM SPECTABILE Reinw. et Hornsch.

LUZON, Subprovince of Benguet, altitude about 1,500 m, *Merrill 7844;* Mount Tonglon, on trees, altitude about 1,800 m, *Merrill 7872:* Subprovince of Bontoc, *Vanoverbergh 672.* MINDANAO, District of Zamboanga, in ravines, altitude about 2,500 m, *Merrill 8360:* District of Cotabato, on decaying logs, altitude 600 m, *Weber 1520:* Subprovince of Butuan, on tree trunks, altitude 548 m, *Weber 1300.*

HYPNODENDRACEAE

HYPNODENDRON (C. Müll.) Lindberg

HYPNODENDRON FORMOSICUM Card.

NEGROS, Canlaon Volcano, on earth, altitude 2,200 m, *Merrill 6816.*

HYPNODENDRON ARBORESCENS (Mitt.) Lindb.

LUZON, Province of Tayabas, Infanta, *Bur. Sci. 9373 Robinson.* POLILLO, *Bur. Sci. 10515 McGregor.*

Area: Ceylon, Java, Sumatra, Celebes.

MNIODENDRON Lindberg

MNIODENDRON DIVARICATUM (Reinw. et Hornsch.) Lindb.

LUZON, Province of Laguna, Mount Banajao, altitude 1820 m, *Bur. Sci. 9818 Robinson.*

Area: Philippines.

MNIODENDRON FUSCO-MUCRONATUM (C. Müll.) Broth.

LUZON, Province of Laguna, Mount Maquiling, altitude 500 m, *Bur. Sci. 9730 Robinson.*

BUXBAUMIACEAE

BUXBAUMIA Hall

BUXBAUMIA JAVANICA C. Müll.

NEGROS, Canlaon Volcano, on trees, mossy forest, very rare, altitude about 2,200 m, *Merrill 6835.*

Area: Java.

POLYTRICHACEAE

POGONATUM Palisot de Beauvois

POGONATUM ALBO-MARGINATUM (C. Müll.) Jaeg.

LUZON, Subprovince of Benguet, on clay banks, along trails, altitude about 1,500 m, *Merrill 7866;* Sablang, *Bur. Sci. 12799 Fénix;* Baguio and vicinity, shaded banks and on earth in ravines, altitude about 1,450-1,500 m, *Bur. Sci. 11972, 14001, 14036, 14049 Robinson:* Subprovince of Bontoc, altitude 1,650 m, *Vanoverbergh 547, 744, 893.*

POGONATUM NUDIUSCULUM Mitt.

LUZON, Subprovince of Benguet, Mount Tonglon, on banks in forests, altitude about 1,800 m, *Merrill 7833.*

POGONATUM WARBURGII C. Müll.

NEGROS, Canlaon Volcano, on earth in forests, altitude 2,200 m, *Merrill 6822.*

POGONATUM SPURIO-CIRRATUM Broth.

LUZON, Subprovince of Benguet, Baguio and vicinity, on earth in ravines, altitude about 1,450 m, *Bur. Sci. 14039 Robinson:* Province of Laguna, Mount Banajao, on earth, altitude about 2,200 m, *Merrill 7532, Bur. Sci. 9836 Robinson.*

POGONATUM MACROPHYLLUM Doz. et Molk.

LUZON, Province of Laguna, Mount Banajao, on earth, altitude 1,600 m, *Bur. Sci. 9799 Robinson.*

POGONATUM MICROPHYLLUM (Doz. et Molk.) Bryol. jav.

NEGROS, Canlaon Volcano, on earth, open slopes of new cone from 1,900 m to near the summit, *Merrill 6815, 6836.*

Area: Borneo, Java.

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LICHENES INSULARUM PHILIPPINARUM, II *

By E. A. WAINIO
(*Helsingfors, Finland*)

Trib. 3. LECANOREAE

1. CANDELARIA Massalongo

1. C. INDICA (Hue) Wain.

C. fibrosa f. *indica* Hue, Lich. Extr.-Eur. no. 335.

Thallus laciniis apice 1.5–0.7 mm latis, crenatis, nec isidiosis, saepe breviter ciliatis, centrum versus margine sorediosis, flavido-citrinis et partim cinereo-glaucescenti-variegatis, KHO non reagentibus, adpressis. Ab hac specie *C. callopizodes* (Nyl.) thallo sorediis destituto differt.

LUZON, Subprov. Bontoc, alt. 1,250 m, *Vanoverbergh 1353*. Ad corticem arboris frondosae.

2. HAEMATOMMA Massalongo

1. H. PUNICEUM (Ach.) Wain.

Var. ESOREDIATA Wain. Étud. Lich. Brés. 1: 72.

LUZON, Subprov. Benguet, mons Pulog, *Bur. Sci. 8954 McGregor;* Pauai, *Bur. Sci. 8598 McGregor*, alt. circ. 2,100 m; *Merrill 7993*, alt. 1,500 m. Ad truncos arborum frondosarum. MINDANAO, Dist. Davao, mons Apo, *Copeland 1196*, alt. 1,800 m. Ad truncum *Agathis albae* Foxw.

3. LECANORA (Ach.) Wainio

1. L. SUBFUSCA (L.) Ach.

Var. CHLARONA Ach.

NEGROS, Bago, Hacienda Louisiana, *Merrill 6792*. Ad corticem *Pithecolobii dulcis*.

Var. TUMESCENS Wain.

Thallus crassitudine mediocris, leviter verruculoso-inaequalis, verruculis increbris, parum elevatis, albidus, KHO lutescens. Apothecia mediocria, 1–2 mm lata, difformia, angulosa aut lobata aut flexuosa, numerosa et partim aggregata, sat crassa, basi bene constricta, disco testaceo-pallido, leviter nitido aut sat opaco, nudo, plano aut subconcavo, margine mediocri, discum

* For Part I see *This Journal* 4 (1909) *Bot.* 651–662.

haud aut parum elevato, irregulari, subcrenulato aut partim subintegro, partim nitido. Stratum medullare excipuli crystallos magnos continens. Epithecium granulosum. Hymenium jodo persistenter caerulescens. Paraphyses arcte cohaerentes. Sporae 8-nae, distichae, ellipsoideae, apicibus rotundatis, simplices, decolores, long. 0.011–0.015, crass. 0.007–0.011 mm. Affinis est var. *chlaroterae* Nyl., at margine haud elevato apotheciorum *L. intumescentem* (Rebent.) Rabenh. in memoriam revocans et ab ea thallo haud laevigato differens.

LUZON, Subprov. Benguet, *Merrill 7983*, alt. 2,000 m. Ad truncum arboris frondosae.

Var. **CHLAROTERA** (Nyl.) Wain l. c. 1: 77.

LUZON, Subprov. Benguet, *Merrill 7937*, alt. 1,500 m. Ad truncum arboris frondosae.

Var. **SUBCRENULATA** Nyl. Lich. Nov. Gran. Addit. 310.

LUZON, Prov. Rizal, Taytay, *Merrill 6342*, ad corticem *Averrhoae bilimbi*. NEGROS, Cabancalan, *Merrill 6740*, ad corticem *Arecae catechu;* Bago, Hacienda Louisiana, *Merrill 6802*, ad corticem *Pithecolobii dulcis*.

2. **L. CARPINEA** (L.) Wain. Not. Syn. Lich. (1886) 23.

L. angulosa (Schreb.) Ach. Lich. Univ. (1810) 364.

LUZON, Prov. Tayabas, Atimonan, *Merrill 3988*. Ad corticem *Cocoes nuciferae*.

3. **L. CINEREOCARNEA** (Eschw.) Wain.

NEGROS, Cabancalan, *Merrill 6738, 6741*, ad corticem *Arecae catechu;* Bago, Hacienda Louisiana, *Merrill 6795, 6796*, ad corticem *Pithecolobii dulcis*.

4. **L. LIVIDOCARNEA** Wain. sp. nov.

Thallus crustaceus, uniformis, crassitudine mediocris aut sat tenuis, verruculoso-inaequalis, verruculis contiguis aut subdispersis, continuus aut parce etiam subdispersus, raro partim sublaevigatus, glaucescens, isidiis et sorediis destitutus, KHO flavescens, $CaCl_2O_2$ non reagens, medulla alba, hypothallo nigricante partim limitatus. Apothecia adpressa, mediocria, circ. 1–2.5 mm lata, disco plano planiusculove, livido-carneo aut lividopallido, nudo, opaco, $CaCl_2O_2$ non reagente, margine sat tenui, in sectione discum versus leviter acutato, discum haud aut leviter superante, leviter crenulato aut tantum latere interiore crenulato aut subintegro aut flexuoso, thallo concolore. Hypothecium albidum aut pallidum. Hymenium jodo persistenter caerulescens. Epithecium pallidum, haud granulosum. Paraphyses arcte cohaerentes. Sporae 8-nae, distichae, decolores, ellipsoideae, apicibus rotundatis, simplices, long. 0.016–0.018, crass. 0.008–0.010 mm. Excipulum intus albidum aut parte peritheciali

infra hypothecio sita pallescente. In stirpem *L. flavovirentis* Fée pertinet, *L. hypocroceae* Wain., Lich. Brés. Exs. no. 873, habitu subsimilis, at reactionibus et colore hypothecii ab ea differens.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Merrill 6650, Bur. Sci. 8582, 8615 McGregor.* Ad corticem arborum frondosarum.

5. L. MERRILLII Wain. sp. nov.

Thallus crustaceus, uniformis, crassitudine mediocris aut sat tenuis, continuus, verruculoso-inaequalis, verruculis subtilissimis, parum elevatis, dispersis aut crebris, substramineo-glaucescens, KHO flavescens, $CaCl_2O_2$ non reagens, isidiis et sorediis destitutus, medulla alba, hypothallo nigricante partim limitatus. Apothecia adpressa, mediocria, circ. 0.8–1.5 mm lata, crebra, disco plano, pallido, nudo, opaco aut sat opaco, neque KHO nec $CaCl_2O_2$ reagente, margine sat tenui, discum haud aut leviter superante, subintegro, thallo concolore, in sectione terete. Hypothecium albidum. Hymenium 0.050–0.075 mm crassum, jodo persistenter caerulescens. Epithecium pallidum, granulosum. Paraphyses arcte cohaerentes, tubulis tenuissimis. Sporae 8-nae, distichae, decolores, oblongae aut rarius ellipsoideae, apicibus obtusis aut rarius rotundatis, simplices, long. 0.011–0.015, crass. 0.005–0.007 mm. Excipulum intus albidum, crystallos magnos continens. Speciei praecedenti affinis.

GUIMARAS, *Merrill 6720.* Ad corticem *Cocoes* in littore crescentes.

6. L. ISIDIOTYLA Wain. sp. nov.

Thallus crustaceus, uniformis, crassitudine mediocris aut sat tenuis, continuus, sat laevigatus aut partim leviter verruculoso-inaequalis, albidus, neque KHO nec $CaCl_2O_2$ reagens, isidiosus, isidiis circ. 0.5 mm longis aut brevioribus, circ. 0.1 mm crassis, cylindricis, simplicibus aut leviter ramosis, sorediis destitutus, medulla alba, jodo non reagente, hypothallo indistincto. Apothecia adpressa, mediocria, circ. 1 mm lata (tantum juvenilia visa), disco concavo aut planiusculo, livido-fuscescente aut livido-pallescente, tenuiter pruinoso, opaco, margine crassiusculo aut sat tenui, prominente, et discum superante, leviter crenulato aut subintegro, thallo concolore, interdum demum parce isidioso, in sectione terete. Hypothecium partim albidum, partim fulvescens, KHO non reagens. Hymenium jodo persistenter caerulescens. Epithecium decoloratum, KHO non reagens. Paraphyses arcte cohaerentes, tubulis tenuissimis. Asci clavati. Sporae haud visae. Affinis *L. flavovirenti* Fée, at thallo isidioso ab ea differens.

MINDANAO, Dist. Davao, mons Apo, alt. 1,800 m, *Copeland 1090 p. p.*

7. **L. ATRA** (Huds.) Ach.

LUZON, Subprov. Benguet, *Merrill 7993 p. p.* Ad corticem arboris frondosae.

4. **PLACOPSIS** Nylander

1. **P. ISIDIOPHORA** Wain. sp. nov.

Thallus crustaceus, arcte adnatus, totus laciniatus lobatusque, laciniis circ. 1.2–0.5 mm latis, sat tenuibus, irregulariter radiantibus, contiguis, partim confluentibus, centro saepe demum areolato-diffractis, esorediatus, centrum versus crebre isidiosus, isidiis circ. 0.5 mm longis aut brevioribus, 0.1 mm crassis, cylindricis, sordide albicans, sat opacus, sat laevigatus, neque KHO nec $CaCl_2O_2$ reagens, at his reagentiis unitis leviter rubescens, subtus pallidus, cephalodiis prominentibus, convexis, 0.5–3 mm latis, integris aut demum vulgo radiatim laciniatis lobatisve, carneo-pallidis aut rarius cinereo-pallidis, gonidia nostocacea continentibus. Apothecia adpressa, basi constricta, mediocria, circ. 2–1 mm lata, zeorina, margine duplice, margine thallode tenui, integro aut crenulato, thallo concolore, margine proprio integro aut crenulato, sat tenui aut interdum inconspicuo disco concolore, prominulo aut discum haud superante, disco plano aut leviter concavo, pallido aut carneo-pallido aut raro cinereo-pallido, tenuiter pruinoso, opaco. Hypothecium cartilagineum, carneum aut carneo-pallidum, KHO non reagens. Hymenium circ. 0.16–0.17 mm crassum. Epithecium sordide carneo-pallidum. Paraphyses tenues, crass. 0.001 mm, laxe cohaerentes, apice arctius cohaerentes crassioresque, ibi etiam ramosae. Asci cylindrici. Sporae 8-nae, monostichae, simplices, decolores, ellipsoideae, apicibus rotundatis, long. 0.010–0.019, crass. 0.009–0.010 mm. Gonidia globosa, diam. 0.005–0.007 mm, dilute flavovirescentia, membrana tenui, distincta.

NEGROS, Canlaon Volcano, alt. 1,800 m, *Merrill 6876.* Ad lignum vetustum.

2. **P. PAPILLOSA** Wain. sp. nov.

Thallus crustaceus, arcte adnatus, totus laciniatus lobatusque, laciniis 0.2–0.5 mm latis, tenuibus, irregularibus, contiguis, partim confluentibus, centro saepe demum areolato-diffractis, esorediatus, centrum versus crebre isidiosus, isidiis circ. 0.3 mm longis aut brevioribus, 0.1 mm crassis, cylindricis, vulgo verrucaeformibus, cinereus aut sordide albicans, opacus, sat laevigatus, neque KHO nec $CaCl_2O_2$ reagens, at his reagentiis unitis leviter rubescens, subtus obscuratus, cephalodiis tuberculiformibus, circ. 0.5–0.7 mm latis, fuscis. Apothecia adpressa, basi constricta, mediocria, circ. 1.3–1 mm lata, lecanorina, margine

simplice, thallode, crassitudine mediocri, integro, thallo concolore, discum haud superante aut rarius leviter prominulo, disco plano, fusco, nudo, opaco. Hypothecium cartilagineum, pallidum. Hymenium circ. 0.14 mm crassum, jodo persistenter caerulescens. Epithecium pallidum aut carneo-pallidum. Paraphyses tenues, crass. 0.0005 mm, laxe cohaerentes, apice arctius cohaerentes, dichotome ramosae, apice etiam ramoso-connexae. Asci cylindrici. Sporae 8-nae, monostichae, simplices, decolores, ellipsoideae, apicibus obtusis aut rotundatis, long. 0.014–0.022, crass. 0.009–0.011 mm. Pycnoconidangia verruculis nigris, parum prominulis indicata. Sterigmata long. 0.020–0.025 mm, basin versus crassit. 0.0015 mm, basin versus dichotome ramosa, apicem versus sensim incrassata, apicibus pycnoconidia efferentibus. Pycnoconidia filiformia, recta aut curvata, long. 0.01–0.02, crass. 0.001–0.0005 mm. Gonidia globosa, flavo-virescentia, simplicia, diam. 0.006–0.007 mm. Proxime affinis speciei praecedenti, at margine apotheciorum simplice, disco fusco et isidiis verrucaeformibus ab ea differens.

NEGROS, Canlaon Volcano, alt. 1,800 m, *Merrill 6866*. Ad lapides.

5. OCHROLECHIA Massalongo

1. **O. PALLESCENS** (L.) Koerb.

Thallus verrucoso-inaequalis, sorediosus, neque KHO nec $CaCl_2O_2$ reagens. Sterilis et eam ob causam determinatione speciei incerta, sed verisimiliter ad hanc speciem pertinens.

MINDANAO, Subprov. Butuan, *C. M. Weber 1396*, alt. 213 m. In rupe.

Trib. 4. PERTUSARIEAE

1. COCCOTREMA Muell.-Arg.

1. **C. CUCURBITULA** (Mont.) Wain.

C. cucurbitula Muell.-Arg. in Nuov. Giorn. Bot. Ital. (1889) 51 p. p. (excl. *C. antarctico* Muell.-Arg. Lich. Cap. Horn 171, quod apice pseudostromatum convexo, nec late impresso, ab hac specie differt).
Pertusaria cucurbitula Mont. Fl. Chil. 8 (1852) 200; Nyl. Addit. Fl. Chil. (1855) 160, Lich. Fueg. (1888) 11, Lich. Nov. Zel. (1888) 71.
Lecanora cucurbitula Muell.-Arg. Lich. Beitr. (Fl. 1884) no. 791.
Perforaria cucurbitula Muell.-Arg. in Nuov. Giorn. Bot. Ital. (1891) 126.

Thallus crustaceus, continuus, verrucis circ. 0.3–0.2 mm latis inspersus, albidus, KHO lutescens, $CaCl_2O_2$ non reagens, sorediis destitutus, cephalodiis verrucaeformibus, verrucis thalli consimillibus aut majoribus, circ. 0.3–0.6 mm latis, et magis elevatis, laevigatis, algas scytonemeas et gonidia cystococcacea continentibus, hypothallo tenui albido ad ambitum plus minusve con-

spicuo. Pseudostromata 1.3–0.8 mm lata, depresso-subglobosa, basi constricta, laevigata aut leviter subverrucosa, thallo concoloria, vertice pallido aut albido-pallescente, impresso, 0.6–0.3 mm lato, KHO intus et dilutius etiam extus lutescentia, apothecium unum continentia, ostiolo demum aperto, rotundato, vix 0.1 mm lato. Perithecium albido-pallescens aut pallidum. Hymenium jodo dilute caerulescens. Paraphyses parce ramoso-connexae, maxima parte simplices, tubulis 0.0015 mm crassis gelatinam abundantem percurrentibus. Asci ventricosi. Sporae 8-nae, distichae, simplices, decolores, ellipsoideae aut oblongae, apicibus rotundatis, membrana 0.002–0.003 mm crassa, haud gelatinosa, laevigata, limite stratorum laevigata, long. 0.045–0.066, crass. 0.024–0.030 mm. Gonidia cystococcacea. Genus *Coccotrema* notis vagis a *Pertusaria* differt, at ob affinitatem proximam cum *Lepolichene* Trev. a *Pertusaria* separanda est.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 8611 McGregor;* mons Pulog, *Bur. Sci. 8962 McGregor.* Ad corticem arborum frondosarum.

2. PERTUSARIA DeCandolle

1. **P. VELATA** (Turn.) Nyl.; Wain. Étud. Lich. Brés. 1: 106.

Thallus KHO non reagens, $CaCl_2O_2$ intus rubescens, extus non reagens (7971) aut punctis rubescentibus (38), his reagentiis unitis rubescens. Medulla jodo non reagens. Pseudostromata et discus apotheciorum KHO non reagentes, $CaCl_2O_2$ rubescentes. Sporae solitariae.

PANAY, Capiz, *Copeland 38 p. p.* LUZON, Subprov. Benguet, alt. 1,500 m, *Merrill 7971.* Ad corticem arborum frondosarum.

2. **P. SUBMULTIPUNCTA** Nyl. Lich. Jap. (1890) 55.

Thallus KHO lutescens, demum sordide subrubescens, extus interdum minus distincte reagens (15623), $CaCl_2O_2$ non reagens aut his reagentiis unitis demum passim parce subrubescens (15623). Medulla thalli jodo non reagens (etiam in specim. orig. in herb. Nyl.). Discus pseudostromatum KHO lutescens deindeque sanguineo-rubescens. Sporae non visae.

LUZON, Subprov. Benguet, 2,000 m. alt., *Merrill 7938;* Baguio, *F. Sanchez 16, For. Bur. 15623 Curran.* Ad truncos *Pini insularis* Endl.

3. **P. REDUCTA** Stirt. in Scott. Naturalist 4 (1877) 28; Leight. Lich. Great Brit. ed. 3 (1879) 229.

Thallus glaucescens vel cinereo-glaucescens, nitidus, crassitudine mediocris, continuus, sat laevigatus, KHO fusco-rubescens, $CaCl_2O_2$ non reagens. Medulla thalli jodo non reagens. Pseudostromata crebra, diam. 0.5–1 (–0.2) mm, albido-sorediosa, KHO

fusco-rubescentia, $CaCl_2O_2$ non reagentia. Sporae non visae. Huc etiam *P. erythrella* Muell.-Arg. Lich. Wils. (1893) 41; Wain. React. Lich. Müll. 8 forsan pertinet.

MINDANAO, Subprov. Butuan, 320 m alt., *C. M. Weber 1376*. Ad corticem.

4. **P. PHILIPPINA** Wain. sp. nov.

Thallus crustaceus, crassitudine mediocris, continuus, sat laevigatus aut leviter rugulosus aut initiis verrucaeformibus apothecciorum crebre inspersus, albidus, KHO non reagens, $CaCl_2O_2$ intus rubescens, extus parum reagens, his reagentiis unitis extus leviter, intus bene rubescens, sorediis et isidiis destitutus, medulla jodo non reagente, hypothallo albido parum distincto. Pseudostromata crebra, fere contigua, 0.7–1 (–1.5) mm lata, elevata, primum depresso-subglobosa, demum irregulariter subcylindrica, basi leviter constricta, sorediis destituta, apothecia solitaria aut raro duo continentia, disco demum aperto, 0.5 mm lato, urceolato-impresso, pallido, subnudo, margine prominente, sat laevigato aut leviter verruculoso-crenulato, thallo concolore. Pseudostromata et discus KHO non reagentes, $CaCl_2O_2$ rubescentes. Sporae binae, oblongae, apicibus rotundatis aut rotundato-obtusis, decolores, haud gelatinosae, membrana circ. 0.006 mm crassa, limite laevigato, stratis typice aequalibus, long. 0.11–0.14, crass. 0.024–0.030 mm. Habitu subsimilis est *P. velatae*.

MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1302*. Ad truncum arboris frondosae.

5. **P. COPELANDII** Wain. sp. nov.

Thallus crassitudine mediocris, continuus aut demum diffractus, verruculoso- et verrucoso-rugosus, glauco-cinereus, subnitidus, sorediis et isidiis destitutus, neque KHO, nec $CaCl_2O_2$ nec jodo reagens, hypothallo nigricante partim limitatus. Pseudostromata thallo concoloria, irregularia aut depresso-subglobosa, long. 1–3, lat. 1–1.7 mm, basi vulgo leviter constricta, verruculoso-rugulosa, neque KHO, nec $CaCl_2O_2$ reagentia, apice vulgo convexo, apothecia vulgo plura (1–5) continentia, verruculis ostiolaribus cinereo-nigricantibus sparsis, leviter aut parum prominentibus, parvulis. Sporae binae et monostichae aut 4-nae et distichae, decolores, oblongae, haud gelatinosae, membrana 0.005 mm crassa, stratis aequalibus, limite laevigato, long. 0.082–0.170, crass. 0.024–0.026 mm. Habitu *P. communem* in memoriam revocans, sed in stirpem *Leioplacarum* pertinens.

PANAY, Capiz, *Copeland 38 p. p.* Ad corticem arborum frondosarum.

Trib. 5. BUELLIEAE

1. ANAPTYCHIA Koerber

1. A. LEUCOMELAENA (L.) Wain.

LUZON, Subprov. Bontoc, *Vanoverbergh 1024, 1283:* Subprov. Lepanto, *For. Bur. 16021 Bacani;* mons Data, alt. 2,100 m, *Merrill 4959:* Subprov. Benguet, *Merrill 7944, Bur. Sci. 5882 Ramos;* mons Tonglon, *Bur. Sci. 5490 Ramos;* Pauai, alt. 1,950 m, *Merrill 4924, Bur. Sci. 8549 McGregor:* Prov. Zambales, *Bur. Sci. 5154 Ramos:* Prov. Pampanga, mons Arayat, alt. 840 m, *Merrill 5194, For. Bur. 19338 Curran:* Prov. Bataan, *For. Bur. 19165 Curran;* mons Mariveles, *Merrill 3686:* Prov. Rizal, *Bur. Sci. 13633 Ramos.* MINDORO, mons Halcon, alt. 1,800 m, *Merrill 6175, 6197.* MINDANAO, Dist. Lanao, mons Malindang, *For. Bur. 4786 Mearns & Hutchinson:* Dist. Zamboanga, alt. 1,260 m, *Copeland "K"*, 390 m alt., *Merrill 8350.* Ad ramos arborum et raro ad terram muscosam.

2. A. HYPOLEUCA (Muhlenb.) Wain.

Var. SCHAERERI (Hepp) Wain. Addit. Lich. Antill.

Thallus sorediis destitutus. Apothecia disco fuscescente, nudo.

LUZON, Subprov. Bontoc, alt. 1,650 m, *Vanoverbergh 1336:* Subprov. Benguet, Pauai, alt. 2,100 m, *Bur. Sci. 8656 McGregor;* mons Pulog, *Merrill 6430;* mons Tonglon, *Bur. Sci. 5480 Ramos.* Ad corticem arborum.

Var. ROTTBOLLII Wain. Addit. Lich. Antill.

Thallus sorediis destitutus. Apothecia disco pruinoso.

LUZON, Subprov. Benguet, mons Tonglon, alt. 2,000 m, *Merrill 7984.* Ad corticem arborum.

Var. SOREDIIFERA (Muell.-Arg.) Wain. Addit. Lich. Antill.

Thallus sorediosus.

LUZON, Subprov. Bontoc, Bauco, alt. 1300 m, *Vanoverbergh 61.* In rupe.

Var. FULVESCENS Wain.

Thallus sorediis destitutus, subtus partim fulvescens et decorticatus, rhizinis squarroso-ramosissimis. Apothecia disco subnudo aut tenuiter pruinoso, margine lobato aut lacinulato, lacinulis in serie simplice dispositis, intus (subtus) partim fulvescentibus. Partes fulvescentes thalli et apotheciorum KHO violascentes. *Pseudophyscia hypoleuca* var. *colorata* Zahlbr. Stud. Bras. Flecht. (1902) 413, thallo sorediioso secundum descriptionem, ab hac var. differt.

LUZON, Subprov. Benguet, alt. 1,500 m, *Merrill 7935, 7966.* Ad corticem arborum.

3. *A. DENDRITICA (Pers.) Wain. Étud. Lich. Brés. 1: 134.

*** An asterisk indicates a subspecies.**

Var. **LAMELLIGERA** (Tayl.) Wain. Addit. Lich. Antill.

Thallus sorediis destitutus.

LUZON, Subprov. Lepanto, mons Data, alt. 2,100 m, *Merrill* 4906. MINDANAO, Subprov. Butuan, *C. M. Weber 1398*. Ad truncos arborum.

Var. **PROPAGULIFERA** Wain. Addit. Lich. Antill.

Thallus sorediatus, subtus decorticatus. Apothecia disco subnudo, margine integro aut lobato, soredioso.

LUZON, Subprov. Benguet, Baguio, alt. 2,150 m, *Bur. Sci. 14071 Robinson*. Ad truncum arboris frondosae.

4. **A. SPECIOSA** (Wulf.) Wain.

Var. **ESOREDIATA** Wain. Catal. Welw. Afr. Pl. Lich. 409.

Thallus sorediis destitutus, laciniis margine subintegris.

LUZON, Subprov. Benguet, *Merrill 7939, For. Bur. 15960 Curran, For. Bur. 15991 Bacani;* Pauai, *Merrill 6646, 6653, Bur. Sci. 8555, 8574, 8593, 8647 McGregor;* Cabayan, *Merrill 4896;* mons Pulog, *Merrill 6426, 6459;* mons Tonglon, *Bur. Sci. 5482, 5485 Ramos*. Ad truncos arborum, in rupe et supra muscos rupium.

Var. **SOREDIOSA** Muell.-Arg. Lich. Beitr. no. 582.

LUZON, Subprov. Benguet, Cabayan, *Bur. Sci. 8784 McGregor*. Ad corticem arboris.

5. **A. ISIDIOPHORA** (Nyl.) Wain. Catal. Welw. Afr. Pl. Lich. 409.

LUZON, Subprov. Benguet, *Bur. Sci. 13506 Ramos*. Ad corticem arboris frondosae.

2. PHYSCIA (Schreb.) Wainio

1. **P. INTEGRATA** Nyl.

Var. **OBSESSA** (Mont.) Wain. f. **SUBALBA** Wain. Addit. Lich. Antill.

Thallus sorediis et pruina destitutus, subtus obscuratus.

LUZON, Prov. Tayabas, Atimonan, *Merrill 3987 p. p.* Ad corticem *Cocoës nuciferae*.

Var. **SOREDIOSA** Wain. f. **TRISTIS** Wain. Lich. Bras. Exs. no. 155.

Thallus sorediosus, superne haud aut parum pruinosus, subtus obscuratus.

LUZON, *Merrill 6331:* Prov. Tayabas, Infanta, *Bur. Sci. 6793 Robinson*. NEGROS, Cabancalan, *Merrill 6743*. Ad corticem *Codiaei variegati, Mangiferae indicae* et aliarum arborum.

2. **P. CRISPA** (Pers.) Nyl.

Var. **MOLLESCENS** (Nyl.) Wain.

LUZON, Prov. Bulacan, Baliuag, *Bur. Sci. 9643 Robinson:* Prov. Rizal, Taytay, *Merrill 6334*. Ad corticem *Arecae catechu* et *Averrhoae bilimbi*. Ster.

Var. HYPOMELA Tuck.

NEGROS, Bago, Hacienda Louisiana, *Merrill 6801*. Ad corticem *Pithecolobii dulcis*. Ster.

3. P. PICTA (Sw.) Nyl.

LUZON, Prov. Tayabas, Atimonan, *Merrill 3997 p. p.* GUIMARAS, *Merrill 6721*. Ad corticem *Cocoës nuciferae*.

3. PYXINE Fries

1. P. ENDOLEUCA (Muell.-Arg.) Wain. Lich. Ruwenzori 42; Catal. Welw. Afr. Pl. Lich. 412.

P. Meissneri var. *endoleuca* Muell.-Arg. Lich. Beitr. (1879) no. 118, 1492; Prim. Fl. Costaric. 55; Hue, Lich. Extra-Eur. no. 354.

Thallus superne glaucescens aut albido-glaucescens, sat laevigatus aut leviter reticulato-rugulosus rimulosusve, isidiis et sorediis destitutus, intus albidus, KHO neque superne nec intus reagens, laciniis circ. 1–0.2 mm latis, continuis, radiantibus, contiguis, parce confluentibus, subtus obscuratis, rhizinis brevibus, concoloribus. Apothecia circ. 1.3–1 mm lata, haud diu excipulo thallode instructa, mox lecideina et extus tota nigra. Excipulum proprium extus fuligineum (superne aeruginoso-fuligineum, inferne fusco-fuligineum), KHO violascens, intus albidum aut dilute intenseve rufescens, KHO violascens. Hypothecium superne fuscescens, inferne rufescens, KHO violascens. Epithecium aeruginoso-fuligineum, KHO violascens. Sporae 8-nae, distichae, fuscescentes aut fumosae, fusiformi-oblongae aut ellipsoideae oblongaeve, apicibus obtusis aut rotundatis, membrana inaequaliter incrassata, in apicibus et in septo bene incrassata, long. 0.013–0.020, crass. 0.006–0.008 mm. Magis affinis est *P. dissectae* (Fee), quam *P. Meissneri*.

CAVILLI (mare Suluense), *Merrill 7183 p. p.* Ad corticem arboris frondosae.

2. P. DISSECTA (Fée) Wain. Addit. Lich. Antill.

P. cocoës Nyl. Lich. Exot. 255 (neque Sw., nec Malme, nec Hue).

Thallus albidus aut glaucescenti-albidus, sorediosus, KHO neque superne nec intus reagens. Medulla alba. Apothecia lecideina, juvenilia haud zeorina. Sporae uniseptatae, membrana inaequaliter incrassata, long. 0.016–0.018, crass. 0.006–0.007 mm. Excipulum extus aeruginoso-fuligineum, KHO violascens, intus albidum. Hypothecium parte superiore vinose rubens, parte inferiore fulvo-rufescens, KHO violascens. Epithecium aeruginoso-fuligineum, KHO violascens. Apotheciis mox lecideinis et

sorediis supra laminam thalli evolutis a *P. connectente* Wain. differt.

GUIMARAS, *Merrill 6723*, ad corticem *Cocoës*. CAVILLI (mare Suluense) *Merrill 7183 p. p.*, ad corticem.

3. **P. GLAUCESCENS** Wain. sp. nov.

Thallus sat tenuis, superne glaucescens, sat opacus, sorediis et isidiis destitutus, epruinosus, medulla alba, KHO superne non reagens, intus sublutescens, dein rubescens (praesertim in zona gonidiali), laciniis circ. 0.5–1 mm latis, irregularibus, subcontinuis, contiguis, planis, leviter reticulato-rugulosis, subtus nigricantibus, rhizinis brevibus, nigricantibus. Apothecia 0.7–1.2 mm lata, lecideina, margine nigricante, mediocri, disco plano, nigro, nudo. Excipulum extus aeruginoso-fuligineum, KHO violascens, intus sordide albidum. Hypothecium inferne albidum, superne fuscescens, KHO violascens. Epithecium aeruginoso-fuligineum, KHO violascens. Sporae 8-nae, distichae, fuscescentes, oblongae, apicibus obtusis, 1-septatae, membrana inaequaliter incrassata, in apicibus et in septo crassiore, long. 0.017–0.022, crass. 0.005–0.008 mm. A *P. retirugella*, cui habitu similis est, colore et reactione thalli et hypothecii differt.

COMIRAN, *Merrill 7167 p. p.* Ad corticem arboris frondosae.

4. **P. CONSOCIANS** Wain. sp. nov.

Thallus sat tenuis, superne glaucescens, sat opacus, epruinosus, leviter reticulato-rugulosus, medulla alba, KHO superne non reagens, intus lutescens deindeque rubescens, laciniis circ. 0.5–1 mm latis, irregularibus, subcontinuis, contiguis, planis, margine isidioideo-granulosis vel verruculosis, subtus nigricantibus, rhizinis increbris brevibus, nigris. Apothecia 0.5–1.6 mm lata, lecideina, margine nigricante aut cinereo-nigricante, mediocri, disco plano, nigro, nudo. Excipulum intus albidum. Hypothecium superne fuscescens, KHO non reagens, subtus albidum. Epithecium aeruginoso-fuligineum, KHO violascens. Sporae 8-nae, distichae, fuscescentes, fusiformes aut oblongae, apicibus obtusis, 1-septatae, membrana inaequaliter incrassata, in apicibus et in septo crassiore, long. circ. 0.020, crass. 0.006 mm. Proxime affinis est *P. glaucescenti*, thallo granuloso et reactione hypothecii ab ea differens et his notis cum *P. retirugella* congruens, quae colore et reactione thalli ab hac specie distinguitur.

COMIRAN, *Merrill 7167 p. p.* Ad corticem arboris frondosae una cum *P. glaucescente*.

5. P. PHILIPPINA Wain. sp. nov.

Thallus sat tenuis crassitudine mediocris, sorediis et isidiis destitutus, superne albidus, sat opacus, epruinosus, laevigatus, medulla alba, KHO superne lutescens, intus lutescens deindeque rubescens, laciniis 0.5–1.4 mm latis, irregularibus, subcontinuis, contiguis, saepe passim confluentibus, planis aut partim convexis, subtus nigricantibus, rhizinis brevibus, nigricantibus. Apothecia 1–4 mm lata, lecideina, margine nigricante aut cinereo-nigricante, tenui aut mediocri, disco plano, nigro, nudo. Excipulum extus aeruginoso-fuligineum, KHO violascens, intus albidum aut cinerascens. Hypothecium superne fuscescens, KHO non reagens, inferne albidum aut cinerascens Sporae 8-nae, distichae, fuscescentes, oblongae, apicibus obtusis, polari-dyblastae, membrana inaequaliter incrassata, in apicibus et in septo crassiore, long. 0.015–0.023, crass. 0.006–0.008 mm. Affinis est *P. denudatae* Wain. Lich. Bras. Exs. no. 1178, thallo haud ruguloso et colore epithecii ab ea differens. *P. retirugella* Nyl. jam thallo ruguloso, margine laciniarum granuloso ab ea distinguitur.

LUZON, Subprov. Bontoc, *Vanoverbergh 780:* Subprov. Benguet, *Merrill 7934.* Ad corticem arborum frondosarum.

6. P. COPELANDII Wain. sp. nov.

Thallus tenuis, glaucescens aut pallido- vel albido-glaucescens vulgo nitidus, soraliis rotundatis, tenuiter farinosis, vulgo supra laminam adspersis, KHO superne leviter lutescens, intus leviter lutescens deindeque rubescens, laciniis 0.3–0.7 mm latis, irregularibus, radiantibus, continuis, contiguis, planis, laevigatis, intus albis, subtus obscuratis, rhizinis brevissimis, nigricantibus. Apothecia incognita. Ab hac specie *P. sorediata* (Ach.) Fr. thallo ambitum versus pruinoso, KHO superne lutescente, medulla alba et passim parce flava, KHO non reagente aut demum pallida secundum specimen orig. in herb. Ach. differt. *P. chrysanthoides* Wain. Addit. Lich. Antill. thallo KHO non reagente et medulla flavida ab his distinguitur. *P. asiatica* Wain. thallo ruguloso et reactione medullae a *P. Copelandii* recedit.

PANAY, Capiz, *Copeland 38 p. p.* Ad corticem arborum frondosarum.

7. P. MICROSPORA Wain sp. nov.

Thallus tenuis, albidus aut partim cinerascens, parum nitidus, laevigatus, sorediis destitutus, epruinosus, intus albus, KHO neque superne nec intus reagens, subtus nigricans, rhizinis brevibus increbris, nigricantibus instructus, laciniis 0.5–0.2 mm latis, irregularibus, contiguis, ambitum versus continuis, centrum versus demum subareolato-diffractis, planis, saepe demum

partim latere parce verruculoso-proliferis. Apothecia 0.7–0.4 mm lata, lecideina, margine tenui, integro, nigricante aut primum cinereo-nigricante, saepe demum excluso, disco nigro, nudo, opaco, plano aut demum convexo. Excipulum extus fusco-fuligineum aut partim aeruginoso-fuligineum, KHO violascens, intus sordide albidum, KHO non reagens. Hypothecium fuscescens, inferne dilute coloratum, KHO non reagens. Epithecium aeruginoso-fuligineum aut aeruginoso-fuscescens, KHO violascens. Sporae 8-nae, distichae, fuscescentes, ellipsoideae aut raro ellipsoideo-oblongae, apicibus rotundatis aut obtusis, 1-septatae, membrana inaequaliter incrassata, in septis et praesertim in apicibus crassiore, juniores polari-dyblastae, long. 0.010–0.013, crass. 0.0055–0.006 mm. Affinis est *P. minutae* Wain. Lich. Bras. Exs. no. 211, sporis ellipsoideis minoribusque ab ea differens.

LUZON, Subprov. Benguet, prope Cabayan, *Bur. Sci. 8804 McGregor*. Ad lapides.

3. BUELLIA De Notaris

1. B. VACCINII Wain. sp. nov.

Thallus crustaceus, uniformis, sat tenuis, e verruculis dispersis aut parce contiguis, subglobosis aut difformibus, 0.2–0.1 (–0.05) mm latis constans, albidus, KHO sordide flavescens, $CaCl_2O_2$ non reagens, hypothallo indistincto. Apothecia 0.5–0.3 mm lata, elevata simplicia aut prolificationibus aggregata, disco plano aut leviter convexo, nigro, nudo, opaco, margine tenui, integro, persistente aut demum subexcluso. Perithecium fusco-nigrum. Hypothecium fusco-nigrum, crassum. Epithecium fusco-nigrum. Paraphyses arcte cohaerentes. Sporae 8-nae, distichae, ellipsoideae aut oblongae, apicibus obtusis aut rotundatis, fuscae aut nigricantes, 1-septatae, medio haud aut parum constrictae, haud gelatinosae, membrana aequaliter incrassata, long. 0.011–0.012, crass. 0.005–0.006 mm. Pycnoconidia filiformia, recta, long. 0.010, crass. 0.0005 mm. Affinis est *B. punctiformi* (Hoffm.).

MINDANAO, Dist. Davao, in summo monte Apo, 2,900 m alt., *Copeland 1157*. Ad corticem *Vaccinii Villarii* Vid.

2. B. PITHECOLOBII Wain. sp. nov.

Thallus crustaceus, uniformis, tenuis, continuus, sat laevigatus aut leviter subverrucoso-inaequalis glaucescens, neque KHO nec $CaCl_2O_2$ reagens, hypothallo indistincto. Apothecia crebra, parva, 0.5–0.3 mm lata, adnata, diu tenuia, demum convexa, KHO non reagentia, disco nigro, nudo, opaco, margine tenuissimo, nigro, opaco, integro, mox excluso. Excipulum fuscum. Hypo-

thecium fuscum. Hymenium circ. 0.07 mm crassum, haud oleosum. Epithecium fuscescens. Sporae 8-nae aut 12-nae aut 16-nae in eodem apothecio, distichae aut polystichae, oblongae, apice rotundato aut obtuso, fuscae, 1-septatae, medio haud aut parum constrictae membrana aequaliter incrassata, long. 0.010–0.013 (–0.015), crass. 0.004–0.006 mm. Paraphyses arcte cohaerentes, apice capitato-clavato, fusco. A *B. polyspora* (Willey) thallo magis evoluto et apotheciis convexis, usque ad marginem adnatis differt.

NEGROS, Bago, Hacienda Lousiana, *Merrill 6794*. Ad corticem *Pithecolobii dulcis*.

3. **B. LAURICASSIAE** (Fée) Wain. Addit. Lich. Antill.

B. triphragmia Auct. p. p.

Thallus albidus, intus KHO flavescens deindeque rubescens. Sporae 8-nae, fuscae, 3-septatae, long. 0.014–0.018, crass. 0.015–0.018 mm, membrana aequaliter incrassata. Hypothecium fuscum. Apothecia nigra, nuda. *B. triphragmia* (Nyl.) thallo KHO lutescente ab hac specie differt.

NEGROS, Cabancalan, *Merrill 6737*, ad corticem *Arecae catechu*. SABTAN (Insulae Batanes), *Bur. Sci. 10193 McGregor*, ad corticem palmae.

Trib. 6. PELTIGEREAE

1. PELTIGERA Willdenow

1. **P. ERIODERMA** Wain. sp. nov.

Thallus foliaceus, long. circ. 45–20 mm, adpressus aut adscendens, lobatus, lobis circ. 30–3 mm latis, margine subintegro, sat laevigatus aut leviter impresso-rugosus, superne totus creberrime tomentosus aut demum plus minusve late glabratus, cephalodiis, sorediis et isidiis destitutus, pallidus aut cinereo-pallidus, opacus, subtus plus minusve late albido-pallescens, medium versus nigricans, reticulato-nervosus, nervis elevatis, fuscescentibus aut ambitum versus pallidis, rhizinas circ. 8–10 mm longas, fuscas, apicem versus byssoideo-tomentosas, byssum confluentem formantes, subsimplices efferentibus. Apothecia lobulis adscendentibus aut margini thalli adnata, horizontalia, 5.5–2 mm lata, disco fusco, nitido aut opaco, nudo, margine pallido, subintegro aut lobulis 0.5–0.3 mm longis, triangularibus crenulato. Hypothecium rufescenti-pallidum, strato medullari gonidiis destituto impositum. Hymenium circ. 0.145 mm crassum. Epithecium rufescens. Paraphyses sat laxe cohae-

rentes, increbre septatae, apicem versus clavatae. Asci cylindrico-ventricosi. Sporae 8-nae, polystichae, fusiformes, apicibus sat acutis aut obtusis, fuscescentes aut rufescenti-pallidae, 3-septatae, long. 0.05–0.06, crass. 0.005–0.006 mm. Stratum corticale pseudoparenchymaticum, circ. 0.04–0.03 mm crassum, e seriebus circ. 3–4 cellularum formatum, membranis sat tenuibus, lumine cellularum 0.012–0.007 mm lato, angulosо-subgloboso, superne hyphis in filamenta ramosa continuatis. Stratum medullare hyphis 0.008–0.006 mm crassis sat leptodermaticis. Gonidia nostocacea, polycoccoidea. Habitu quasi magnum *Erioderma*.

LUZON, Subprov. Benguet, mons Pulog, *For. Bur. 16362 Curran, Merritt, & Zschokke, Bur. Sci. 8936 McGregor.* Ad truncos putridos arborum et ad terram muscosam.

2. **P. CRENULATA** Wain. sp. nov.

Thallus foliaceus, long. circ. 30–20 mm, adscendens, laevigatus, glaber, sorediis, isidiis et cephalodiis destitutus, livido-cinereo-pallido-cinereo- et olivaceo-fuscescenti-variegatus, sat nitidus, irregulariter lobatus, lobis circ. 4–20 mm latis, margine crenulatis, subtus crebre subreticulato-nervosus, nervis leviter elevatis, angustis aut partim late confluentibus, ambitum versus pallidis et medium versus fusco-nigricantibus, interstitiis angustis albidis, medium versus obscuratis, rhizinas sparsas et medium versus creberrimas, cinereo-fuscescentes aut nigricantes, breves, circ. 0.5–1.5 mm longas, penicillatas et tomentosas efferentibus. Sterilis. Thallus superne et subtus sicut in *P. horizontali* (L.) DC., quae autem margine thalli haud crenulato ab hac specie differt.

LUZON, Subprov. Benguet, mons Pulog, *Merrill 6424.* Ad plantes destructas et terram humosam.

3. **P. POLYDACTYLON** (Neck.) Hoffm. f. **MELANOCOMA** (Mont. & v. d. Bosch) Wain. Étud. Lich. Brés. 1: 180.

Luzon, Subprov. Benguet, *For. Bur. 980 Barnes, Bur. Sci. 2847 Mearns;* frequenter in summo monte Pulog, 2,900 m alt., *For. Bur. 16435, 16356 Curran, Merritt, & Zschokke, Bur. Sci. 8947 McGregor, Merrill 6451;* Pauai, alt. circ. 2,100 m, *Bur. Sci. 8530, 8531 McGregor;* mons Tonglon, 2,000 m alt., *Merrill 7940, 7979;* Baguio, 1,500 m alt., *Merrill 4882:* Subprov. Lepanto, *For. Bur. 16020, 16023 Bacani;* mons Data, 2,250 m alt., *Merrill 4925:* Prov. Zambales, *For. Bur. 8184, 8199 Curran & Merritt;* mons Pinatubo, *Bur. Sci. ..... Foxworthy.* MINDORO, mons Halcon, *Merrill 6187.* MINDANAO, Dist. Zamboanga, circ. 1,000 m alt., *Merrill 8348, Copeland "E".* Supra muscos ad terram et in rupibus et ad truncos putridos.

4. **P. NANA** Wain. sp. nov.

Thallus foliaceus, long. circ. 30–15 mm, adscendens, laevigatus, glaber, sorediis et isidiis destitutus, olivaceus aut pallido-glaucescens, sat nitidus, subtus plus minusve late albido-pallescens, medium versus nigricans, reticulato-nervosus, nervis cinereo-fuscescentibus aut nigricantibus aut ambitum versus pallidis, nudis aut basin versus rhizinis circ. 2–10 mm longis, subsimplicibus, pallidis aut fusco-nigricantibus instructus. Apothecia lobulis adscendentibus adnata, demum ellipsoidea, fere convoluta convexaque, fusca. Hypothecium rufescenti-pallidum. Hymenium circ. 0.1 mm crassum. Epithecium rufescens. Paraphyses apice capitato-clavatae. Sporae 8-nae, polystichae, dilute pallidae aut subdecolores, fusiformi-aciculares, apicibus sat obtusis aut altero attenuato, 3-septatae, long. 0.046–0.077, crass. 0.003 mm. Affinis est speciei praecedenti et forsan ejus variatio, analoga *P. spuriae* (Ach.). *P. spuriella* Wain. thallo ad apothecia verruculoso-scabrido ab ea differt.

LUZON, Subprov. Benguet, *Bur. Sci. 5878 Ramos;* Baguio, alt. 1,450 m, *Bur. Sci. 14058 Robinson:* Subprov. Lepanto, mons Malaya, *F. R. Bona 156.* Ad terram arenosam.

5. **P. MACRA** Wain, sp. nov.

Thallus foliaceus, long. circ. 50–20 mm, adscendens, laevigatus, glaber, sorediis, isidiis et cephalodiis destitutus, pallidus aut olivaceo- vel pallido-glaucescens, sat nitidus, irregulariter lobatus, lobis circ. 3–15 mm latis, subtus albidus, crebre reticulato-nervosus, nervis elevatis, angustis, pallidis aut medium versus cinereo-fuscescentibus, rhizinas concolores, creberrimas, 0.5–1 mm longas, medium versus usque ad 7 mm longas, penicillatas aut partim irregulariter connexas confluentesque efferentibus. Apothecia lobulis adscendentibus adnata, demum ellipsoidea, fere convoluta convexaque, fusca. Hypothecium rufescenti-pallidum. Hymenium circ. 0.1 mm crassum. Epithecium rufescens. Paraphyses clavati. Sporae 8-nae, polystichae, dilute pallidae aut subdecolores, fusiformi-aciculares, apicibus sat obtusis, rectae, 3–5–7-septatae, long. 0.060–0.075, crass. 0.003–0.0035 mm. Habitu praecedenti et *P. spuriae* (Ach.) similis, nervis e rhizinis breviter crebreque tomentosis dignota.

LUZON, Prov. Pangasinan, *Bur. Sci. 8298 Ramos:* Subprov. Benguet, *Bur. Sci. 5478 Ramos:* Subprov. Bontoc, *Vanoverbergh 330.* Ad terram calcaream et argillaceam et humosam.

2. OPISTERIA (Ach.) Wainio

1. **O. TROPICA** (Muell.-Arg.) Wain. Lich. Pitlekai Sib. Sept. (1909) 93. *Nephromium tropicum* Muell.-Arg. Lich. Beitr. (Fl. 1883) no. 599; Hue, Lich. Extra.-Eur. no. 368.

Thallus superne livido-fuscescens aut cinerascens aut cinereo-fuscescens, glaber, laevigatus aut partim rugosis angustis elevatis instructus, margine isidioideo-lacinulatus et isidiosus, isidiis subteretibus aut leviter applanatis subsimplicibus etiam supra lamiam saepe passim instructus, subtus partim breviter tomentosus partim glaber, obscuratus aut ambitum versus pallidus aut late pallidus, medulla alba, KHO non reagente. Apothecia resupinata, 0.3–0.7 mm lata, dorso vulgo obsolete verruculoso aut sublaevigato, glabro aut leviter tomentoso, disco fusco aut rufo, opaco, nudo, margine membranaceo, angusto, pallido, lacinulato aut isidioso aut rarius subintegro. Hypothecium rufescens aut rufescenti-pallidum. Hymenium circ. 0.09 mm crassum, jodo persistenter glaucescenti-caerulescens. Paraphyses sat arcte cohaerentes, apice leviter clavato-incrassatae. Asci clavati. Epithecium pallidum aut rufescenti-pallidum. Sporae 8-nae, distichae, rufescentes, oblongae aut fusiformi-oblongae, apicibus obtusis aut rotundato-obtusis, 3-septatae, long. 0.018–0.022, crass. 0.006–0.007 mm.

LUZON, Subprov. Benguet, 1,500 m alt., *Merrill 7982;* mons Pulog, *Merrill 6457, Bur. Sci. 8933, 8943 McGregor.*

Trib. 7. STICTEAE

1. PSEUDOCYPHELLARIA Wainio

1. **P. AURATA** (Ach.) Wain. Étud. Lich. Brés. 1: 113.

LUZON, Subprov. Benguet, 1,500 m. alt., *Merrill 7956 p. p.;* Pauai, alt. 2,100 m, *Bur. Sci. 8641 McGregor.* Ster. Ad cortices arborum frondosarum.

2. **P. FLAVICANS** (Hook. & Tayl.) Malme, Beitr. Stict. Feuerl. (1899) 29.

Thallus superne praesertimque margine isidiosus et isidioideo-laceratus, flavido-glaucescens, medulla lutea, KHO non reagente, subtus pallidus aut flavido-pallescens aut centrum versus demum fuscescens, tomento crebro brevi pallido aut demum cinerascente obscuratove obductus aut partim denudatus pseudocyphellis luteis, vulgo verrucaeformibus aut demum applanatis instructus. Gonidia pleurococcacea.

LUZON, Subprov. Benguet, 1,500 m alt., *Merrill 7956 p. p., Bur. Sci. 13510 Ramos;* mons Tonglon, 2,000 m alt., *Merrill 7953.* Ster. Ad corticem pini et arborum frondosarum.

3. **P. MULTIPARTITA Wain. sp. nov.**

Thallus margine anguste laciniatus, lacinulis partim isidioideis, saepe partim etiam lamina isidiosa, superne pseudocyphellis destitutus, glaucescens, KHO non reagens, sat laevigatus, intus albus, nec KHO nec $CaCl_2O_2$ nec his reagentiis unitis reagens, subtus obscuratus, ambitum versus pallidus, rhizinis concoloribus, crebris, brevibus instructus, aut partim ambitum versus denudatus, pseudocyphellis parvis, punctiformibus, haud aut leviter prominentibus, albis. Apothecia in lamina thalli sparsa, 1.7–1 mm lata, disco fusco, concavo aut plano, margine sat tenui, integro, superne disco concolore aut pallido. Excipulum extus leviter verruculosum, glabrum, gonidia continens, in margine gonidiis destitutum. Hypothecium fulvescens aut fulvescenti-pallidum. Epithecium fulvo-rufescens. Sporae 8-nae, distichae, fusiformes, apicibus obtusis, 1-septatae, raro 2-septatae, rufescentes, long. 0.020–0.023, crass. 0.007–0.010 mm. Gonidia pleurococcacea, diam. 0.005–0.010 mm, flavescentia, simplicia. Habitu similis est "*Stictae multifidae* Laur." (no. 33530 in herb. Nyl., ex insulis Viti), cujus medulla autem KHO et $CaCl_2O_2$ unitis rubescens. *P. subvariabilis* (Nyl.) reactione cum *P. multipartita* congruens, at thallo superne et inferne pallido et subtus late denudato ab ea differt. *S. variabilis* var. *polyschista* Mey. & Flot., in Manila lecta, ex opinione Muell.-Arg. ad *P. subvariabilem* pertinet, at reactione thalli defecte cognita.

LUZON, Prov. Pampanga, mons Arayat, *For. Bur. 19334 Curran:* Prov. Batangas, *For. Bur. 7809 Curran & Merritt.* Ad truncos arborum et supra muscos.

4. **P. PHAEORHIZA Wain. sp. nov.**

Thallus margine anguste laciniatus, lacinulis partim isidioideis, sat laevigatus, superne pseudocyphellis destitutus, glaucescenti-pallidus, nec KHO, nec $CaCl_2O_2$ reagens, at his reagentiis unitis intus rubescens, subtus pallidus aut centrum versus obscuratus, rhizinis pallido-fuscescentibus aut ambitum versus pallidis, crebris, brevibus instructus, aut partim ambitum versus denudatus, pseudocyphellis parvis aut sat parvis, haud aut leviter prominentibus, albis, medulla alba. Apothecia marginalia aut in lamina thalli sparsa, 4–1.5 mm lata, disco rufo, plano, margine integro, sat crasso, pallido. Excipulum extus verruculosum, glabrum, gonidia tantum in infima basi continens. Hypothecium pallidum. Epithecium rufescens. Sporae 8-nae, distichae, rufae, fusiformes, apicibus sat obtusis, diu 1-septatae, demum 3-septatae, long. 0.020–0.032, crass. 0.009–0.011 mm. Gonidia pleurococcacea, flavescentia, vulgo simplicia, diam.

0.006–0.007 mm. Etiam in *P. prolificante* (Nyl.) Wain. (secund. specim. orig. no. 33467 in herb. Nyl.) stratum medullare thalli KHO et $CaCl_2O_2$ unitis rubescens. Ab ea non differt *S. psilophylla* Muell.-Arg. Thallo subtus pallido, late denudato, a *P. phaeorhiza* distinguuntur.

LUZON, Prov. Laguna, mons Banajao, *Bur. Sci. 9798, 9867 Robinson, O. W. Calvin 322.* MINDANAO, Dist. Lanao, Castra Keithley, *Mary Strong Clemens 1320 p. p.* Ad truncos arborum.

5. P. HOMALOSTICTA Wain. sp. nov.

Thallus margine anguste laciniatus, lacinulis partim isidioideis, saepe partim etiam lamina isidiosa, sat laevigatus, superne pseudocyphellis albis, parvis, punctiformibus, prominentibus instructus, cinereo-glaucescens aut partim pallido-glaucescens, intus albus, nec KHO, nec $CaCl_2O_2$, nec his reagentiis unitis reagens, subtus late pallidus et centrum versus obscuratus, rhizinis fuscescentibus aut ambitum versus pallidis, crebris, brevibus obductus, pseudocyphellis albis, parvis, vulgo prominentibus, sat crebris instructus. Gonidia pleurococcacea, vulgo simplicia, flavescentia, diam. circ. 0.006–0.010 mm. Lacinulis et isidiis et reactionibus thalli congruens cum *P. episticta* (Nyl.), quae pseudocyphellis in pagina inferiore thalli parcissime evolutis ab ea distinguitur.

LUZON, Prov. Rizal, *Bur. Sci. 13453 Ramos.* Ad truncos arborum. Ster.

6. P. QUERCIFOLIA (Tayl.) Wain.

Thallus dichotome sat crebre aut sat increbre repetito-laciniatus, laciniis circ. 2–10 mm. latis, sat linearibus aut subcuneatis, apicibus subtruncatis aut rotundatis aut obtusis, axillis latis aut sat angustis, rotundatis aut obtusis, superne impressopunctatus foveolatusve (ex pseudocyphellis prominentibus paginae inferioris), ceterum sat laevigatus, pallidus aut pallidoglaucescens aut olivaceo- vel fuscescenti-pallidus, saepe nitidus, sat tenuis, haud valde fragilis, isidiis et sorediis destitutus, intus albidus, KHO nec superne nec intus reagens, addito $CaCl_2O_2$ intus distincte pulchreque rubescens, reactione vulgo cito evanescente, subtus pallidus rhizinis pallidis aut fuscescentibus, brevibus aut sat brevibus, crebris aut rarius partim increbis obductus aut rarius partim late denudato, vulgo sat laevigatus, pseudocyphellis albis, mediocribus aut parvis, circ. 1–0.3 mm latis, sat crebris, prominentibus instructus. Gonidia pleurococcacea. Apothecia marginalia aut supra thallum sparsa, 3–1.5 mm lata, disco fusco aut nigricante aut rufo, opaco, nudo, plano aut concavo, margine sat tenui, saepe inflexo, excipulo extus verru-

coso aut raro laevigato, verrucis e pilis crebre septatis, sat pachydermaticis, brevibus, partim conglutinatis formatis, gonidiis destituto, extus vulgo testaceo-pallido. Hypothecium pallidum. Epithecium rufescens. Sporae 8-nae, distichae, fusiformes, apicibus obtusis, fuscescentes, diu 1-septatae, p. p. demum 3-septatae, long. 0.028–0.034, crass. 0.008–0.009 mm.

LUZON, Prov. Cagayan, *For. Bur. 16706 Bacani:* Subprov. Lepanto, *For. Bur. 16022 Bacani;* mons Data, alt. 2,250 m, *Merrill 4981:* Subprov. Benguet, *Bur. Sci. 5880 Ramos;* mons Pulog, *Merrill 6453, Bur. Sci. 8930 McGregor;* mons Tonglon, *For. Bur. 5052 Curran, Bur. Sci. 5491a, 5494, 5495a Ramos;* Pauai, circ. 2,100 m alt., *Bur. Sci. 8534, 8536 McGregor, Bur. Sci. 4437, 4541 Mearns:* Prov. Bataan, *For. Bur. 19166 Curran;* mons Mariveles, *Bur. Sci. 6216 Robinson:* Prov. Rizal, *Bur. Sci. 13454 Ramos:* Prov. Laguna, mons Banajao, *Bur. Sci. 9814, 9868 Robinson.* MINDANAO, Prov. Misamis, mons Malindang, *For. Bur. 4809 Mearns & Hutchinson:* Dist. Lanao, Castra Keithley, *Mary Strong Clemens 1317.* MINDORO, mons Halcon, 1,800 m alt., *Merrill 6214, 6191 p. p., 6220.* Ad truncos arborum.

7. **P. DISSIMULATA (Nyl.) Wain.**

Var. HYPOPHAEA Wain.

Thallus subtus pallidus aut medium versus obscuratus, rhizinis brevibus, crebris fuscescentibus obductus aut apices versus denudatus. Thallus superne glaucescens, leviter nitidus, inaequalis, subreticulato-rugosus aut fossulatus, isidiis et sorediis destitutus, medulla alba, superne et intus nec KHO, nec $CaCl_2O_2$, nec his reagentiis unitis reagens, pseudocyphellis vulgo prominentibus, mediocribus aut parvis. Apothecia marginalia aut raro parce etiam supra thallum sparsa, 2.5–1 mm lata, disco rufo aut fusco-nigricante plano, opaco, margine mediocri aut sat tenui, nec prominente, nec flexuoso, excipulo extus demum verrucoso, gonidiis destituto, extus pallido. Hypothecium pallidum. Epithecium pallidum aut rufescens. Sporae 8-nae, distichae, rufescentes, fusiformes, apicibus sat obtusis, demum 3-septatae, long. 0.022–0.026, crass. 0.007–0.009 mm. Gonidia pleurococcacea.

LUZON, Prov. Laguna, mons Banajao, *For. Bur. 7990 Curran & Merritt:* Prov. Batangas, parce cum *For. Bur. 7823 Curran & Merritt.* MINDANAO, Dist. Zamboanga, 1,000–1,300 m alt., *Merrill 8347, 8349, 8351.* Ad truncos arborum.

Var. NUDIOR Wain.

Thallus subtus pallidus aut albido-pallescens, rhizinis concoloribus aut raro demum obscuratis increbris aut crebris passim parce obductus, late aut fere totus denudatus. Thallus superne glaucescens aut partim pallido-glaucescens, leviter nitidus aut sat opacus, inaequalis, isidiis et sorediis destitutus, medulla alba, superne et intus nec KHO, nec $CaCl_2O_2$, nec his reagentiis unitis

reagens, pseudocyphellis vulgo prominentibus, parvis. Gonidia pleurococcacea.

LUZON, Prov. Pampanga, mons Arayat, *Merrill 3843:* Prov. Bataan, mons Mariveles, *Whitford 241:* Prov. Batangas, *For. Bur. 7883 p. p. Curran & Merritt.* NEGROS, Canlaon Volcano, 1,600 m alt., *Merrill 6889.* Ad truncos arborum.

Var. **CURRANII** Wain.

Thallus subtus pallidus et medium versus obscuratus, rhizinis fuscescentibus, crebris aut passim increbris obductus, superne olivaceo-virescens, leviter nitidus, leviter impresso-punctatus. Thallus crebre ramosus, isidiis et sorediis destitutus, medulla alba, pseudocyphellis parvis, crebris, prominentibus, superne et intus nec KHO, nec $CaCl_2O_2$, nec his reagentiis unitis reagens. Gonidia pleurococcacea. Apothecia marginalia et parce supra thallum sparsa, 1–2 mm lata, disco fusco, opaco, plano aut leviter convexo, margine sat tenui aut demum excluso, excipulo extus demum verrucoso, verrucis parenchymaticis, gonidiis omnino destituto. Hypothecium pallidum. Epithecium rufescens aut pallidum. Sporae 8-nae, fusiformes, apicibus sat obtusis, rufescentes, 1–3-septatae, long. 0.022–0.028, crass. 0.007–0.010 mm, membrana intus verrucoso-inaequali. *P. homoeophylla* (Nyl.) thallo crassiore, pallido, apotheciis majoribus, cet. ab hac varietate differt.

LUZON, Prov. Pampanga, mons Arayat, *For. Bur. 19341 Curran.* Ad truncum arboris.

8. **P. CROCATA** (L.) Wain.

LUZON, Subprov. Benguet, mons Pulog, *Merrill 6458, Bur. Sci. 8935 McGregor.* MINDANAO, Dist. Davao, mons Apo, 1,900 m alt., *Copeland 1093.* Etiam fertiles. Ad ramos arborum.

9. **P. GILVA** (Thunb.) Malme.

LUZON, Subprov. Benguet, 1,500 m alt., *Merrill 7950;* Pauai, alt. circ. 2,100 m, *Bur. Sci. 8528, 8562, 8595, 8627 McGregor;* mons Tonglon, 2,000 m alt., *Merrill 7962, 7972.* MINDANAO, Dist. Davao, mons Apo, 1,800 m alt., *Copeland 1089, 1092 p. p.* In arboribus.

10. **P. SUBPUNCTULATA** (Nyl.) Wain.

Thallus superne impresso-punctatus, foveolatusve, isidiis et sorediis destitutus, medulla alba, KHO non reagente, at addito hypochlorite calcico roseo-rubescente. Gonidia nostocacea. Excipulum gonidiis destitutum. Hypothecium albidum aut passim pallidum. Epithecium rufescens aut testaceum. Sporae 8-nae, distichae, fuscescentes, fusiformes, apicibus sat acutis aut sat obtusis, 3-septatae, long. 0.027–0.032, crass. 0.009–0.011 mm.

Habitu omnino similis est *P. quercifoliae* (Tayl.), at gonidiis ab ea differens.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 4553 Mearns, Bur. Sci. 8550 McGregor;* mons Pulog, *For. Bur. 16360 Curran, Merritt, & Zschokke, Bur. Sci. 8927, 8934, 8938 McGregor;* mons Tonglon, *Bur. Sci. 5486, 5492 Ramos, For. Bur. 11069 Whitford:* Prov. Zambales, *For. Bur. 8197 Curran & Merritt:* Prov. Rizal, *Bur. Sci. 13452 Ramos:* Prov. Laguna, mons Banajao, circ. 2,000 m alt., *Bur. Sci. 6556 Robinson, Merrill 7525.* MINDORO, flumen Alag, *Merrill 5497.* Ad truncos arborum.

11. P. CINNAMOMEA (Rich.) Wain.

Thallus KHO nec superne nec intus reagens, addito $CaCl_2O_2$ intus rubescens, subtus haud costato-incrassatus, margine isidiosus, sorediis destitutus, medulla alba, pseudocyphellis albis, mediocribus. Gonidia nostocacea. Apothecia manginalia et parce supra thallum sparsa, 4.5–2 mm lata, disco fusco aut rufo, nitido aut opaco, plano aut concavo, margine mediocri, integro, excipulo extus areolato-diffracto aut subverrucoso, glabro, gonidiis destituto. Hypothecium pallescens. Epithecium rufescens aut pallidum. Sporae 8-nae, distichae, fusiformes, apicibus sat obtusis, fuscescentes, diu 1-septatae, demum 3-septatae, long. 0.023–0.030, crass. 0.007–0.011 mm. Secundum specim. orig. no. 34107 in herb. Nyl. huc pertinet *Stictina fragillima* var. *dissimilis* Nyl. Syn. Lich. 336, etiam reactionibus huic congruens. In specimine orig. *S. fragillimae* Bab. no. 34115 in herb. Nyl. medulla thalli KHO, addito $CaCl_2O_2$ non reagens.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 4432 Mearns, Bur. Sci. 8546, 8561, 8599 McGregor;* mons Pulog, *Bur. Sci. 8950 McGregor;* mons Tonglon, *For. Bur. 5049 Curran:* Subprov. Lepanto, mons Data, 2,250 m alt., *Merrill 4976.* Ad truncos arborum.

12. P. INTRICATA (Del.) Wain.

Thallus sat laevigatus, tantum margine sorediosus, nec KHO, nec $CaCl_2O_2$ reagens. Apothecia marginalia, 2–1.5 mm lata, tenuia, disco rufo aut fusco, nitido aut opaco, plano, margine tenui, integro, excipulo extus minute verruculoso, gonidiis destituto. Hypothecium pallidum aut rufescenti-pallidum. Epithecium rufescens. Sporae 8-nae, distichae, fusiformes, apicibus obtusis, fuscescentes, diu 1-septatae, parce demum 3-septatae, long. 0.024–0.030, crass. 0.006–0.008 mm. Medulla thalli alba. Pseudocyphellae albae, sat latae aut mediocres. Gonidia nostocacea.

LUZON, Subprov. Benguet, *For. Bur. 15864 Bacani;* mons Tonglon, alt. 2,000 m, *Merrill 7952, Bur. Sci. 5488 Ramos;* mons Pulog, *Bur. Sci. 8951 McGregor:* Subprov. Bontoc, *Vanoverbergh 740.* MINDANAO, Prov. Misamis, mons Malindang, *For. Bur. 4785 Mearns & Hutchinson:* Dist. Davao, mons Apo, alt. 1,800 m, *Copeland 1092 p. p.* Ad truncos arborum.

Var. THOUARSII (Del.) Nyl.

Soraliis supra laminam thalli sparsis. Thallus KHO, addito $CaCl_2O_2$ non reagens.

LUZON, Subprov. Benguet, *Sanchez 15;* Baguio, *Eur. Sci. 11994 p. p. Robinson;* Pauai, alt. 2,100 m, *Bur. Sci. 8589 McGregor:* Subprov. Bontoc, *Vanoverbergh 781.* **Ad truncos arborum.**

13. P. ARGYRACEA (Bor.) Wain.

Thallus in superficie laminae et saepe in margine thalli pseudocyphellis instructus albis, vulgo demum isidia fragilia formantibus, saepe etiam margine isidiosus, medulla alba, pseudocyphellis albis, mediocribus, sat crebris in pagina inferiore instructus, KHO nec superne nec intus reagens, addito $CaCl_2O_2$ intus rubescens. Gonidia nostocacea. Apothecia marginalia et supra laminam thalli sparsa, 1–2 mm lata, tenuia, disco fusco-nigro aut fusco, opaco, plano, margine tenui, integro, excipulo extus increbre verruculoso aut sublaevigato, gonidiis destituto. Hypothecium pallidum aut rufescens. Epithecium pallido-rufescens. Sporae 8-nae, distichae, oblongae, apicibus obtusis, rufescentes, 1-septatae, long. 0.022–0.028, crass. 0.007–0.009 mm.

LUZON, Prov. Pampanga, mons Arayat, *For. Bur. 19342 Curran:* Prov. Rizal, *Bur. Sci. 13634 Ramos:* Prov. Laguna, mons Banajao, *Bur. Sci. 6587 Robinson.* MINDANAO, Subprov. Butuan, *C. M. Weber 1352, 1375:* Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1320 p. p.* INSULAE BATANES, *Bur. Sci. 3860 Fénix.* **Ad truncos et ramos arborum.**

Var. REVENIENS Wain.

Thallus in pagina superiore pseudocyphellis parvis aut sat parvis instructus, isidiis destitutus. Thallus superne leviter fossulato-rugulosus, olivaceo-glaucescens, leviter nitidus, crebre dichotome repetito-laciniatus, laciniis 12–2 mm latis, apicibus vulgo truncatis, subtus ambitum versus late pallidus, centrum versus fuscescens, rhizinis concoloribus, brevibus, crebris obductus, KHO nec superne nec intus reagens, addito $CaCl_2O_2$ intus rubescens.

LUZON, inter prov. Albay et Sorsogon, *For. Bur. 12394 Curran.* **Ad corticem arboris.**

14. P. TOMENTOSA (Mey. & Flot.) Wain.

Sticta Richardi var. *tomentosa* Mey. & Flot. in Nov. Act. Acad. Caes. Leop.-Car. Nat. Cur. 19 (1843) Suppl. 1: 216.

Pseudocyphellis majoribus, apotheciis marginalibus axillis laciniarum latioribus ceterisque notis secundum specim. orig. no. 34046 in herb. Nyl. a *P. foveolata* (Del.) differt.

LUZON, ad truncos arborum, *Meyen.*

2. STICTA (Schreb.) Wainio

1. S. MANILENSIS Wain. sp. nov.

Thallus sat irregulariter crebre iteratim laciniatus lobatusque, laciniis circ. 22–2 (–1) mm latis, basin versus vulgo angustatis, apicibus saepe subtruncatis aut rotundatis, superne sat laevigatis, pallidus aut testaceo-fuscescenti-variegatus, sat opacus, glaber, sorediis et isidiis destitutus, subtus pallidus aut centrum versus obscuratus, rhizinis concoloribus, brevibus, sat crebris, cyphellis circ. 0.3–1 mm latis, KHO et $CaCl_2O_2$ nec superne nec intus reagens. Apothecia marginalia et parcius supra thallum sparsa, 5–2.5 mm lata, parmelioideo-elevata, disco fusco aut rufo, saepe sat nitido, concavo aut planiusculo, margine primum inflexo et supra discum formante, demum crenulato aut subintegro, mediocri, excipulo extus verruculoso, pilis brevibus, crebre articulatis, pachydermaticis, gonidia continente. Hypothecium pallidum. Epithecium testaceum aut rufescenti-pallidum. Sporae 8-nae, polystichae, fusiformes, apicibus acutis aut sat obtusis, pallidae aut dilute fuscescentes, 1-septatae, long. 0.044–0.050, crass. 0.004–0.006 mm. Gonidia pleurococcacea. Habitu similis est *S. subcaperatae* Nyl., quae secundum specim. orig. in herb. Nyl. excipulo gonidia continente instructa est, at sporis crassioribus brevioribusque 3-septatis (–6-septatis) ab ea distinguitur.

LUZON, Subprov. Benguet, mons Pulog, *For. Bur. 16354 Curran, Merritt, & Zschokke:* Prov. Zambales, mons Pinatubo, *Bur. Sci. 2538 Foxworthy.* Ad truncos arborum.

2. S. CAPERATA Bory.

Apothecia gonidiis destituta secund. specim. orig. no. 33639 in herb. Nyl. Ad hac non est distinguenda *S. caperata* var. *javanica* Nyl. Fl. (1869) 118, in insulis Philippinis a Cuming lecta (no. 2176), sporis "long. 0.05–06, crass. 0.009–0.011 mm, 1–5-septatis" secundum annotationem Nylanderi in sched., et excipulo gonidiis destituto instructa.

3. S. RECEDENS (Muell.-Arg.) Wain.

Thallus increbre dichotome repetito-laciniatus, laciniis circ. 13–4 mm latis, apicibus subtruncatis aut obtusis, axillis latis, rotundato-obtusis, superne sat laevigatus aut leviter impresso- vel ruguloso-inaequalis, cinereo- aut olivaceo-glaucescens aut fusco-pallescens, sorediis et isidiis destitutus, subtus centrum versus fuscescens et ambitum versus aut totus pallescens, rhizinis brevibus, fuscescentibus, increbris aut partim crebris aut evanescentibus aut subtus fere totus nudus, basin versus saepe costatus, cyphellis parvis, basi breviter stipitiformi-contracta et vulgo in-

crassata et saepe radiciforme elongata. Apothecia marginalia aut p. p. supra thallum sparsa, 2–1.3 mm lata, disco rufo aut testaceo-rufescente aut fusco, plano aut concavo, margine subintegro aut leviter crenulato verruculosove, excipulo ceterum sat laevigato, gonidiis destituto. Hypothecium pallidum aut pallido-rufescens. Epithecium pallidum aut pallido-rufescens. Sporae 8-nae, distichae, decolores aut pallescentes, fusiformes, apicibus sat acutis aut rarius obtusis, 1–3-septatae (raro etiam 8-septatae: in no. 7823), long. 0.036–0.052, crass. 0.008–0.010 mm. Gonidia pleurococcacea. *S. hypopsiloides* Nyl. secundum specimina originalia in herb. Nyl. thallo breviter stipitato cum hac specie congruens, laciniis latioribus magisque irregularibus ab ea differt. *S. dichotoma* Del. thallo haud stipitato ab ea distinguitur. *S. canariensis* Bory secundum specim. orig. no. 1943 in herb. Nyl. thallo pallido-flavicante dignota, basi stipitata cum *S. recedente* congruens. *S. dichotomoides* Nyl. laciniis angustioribus et cephalodiis marginalibus, arbusculaeformibus elongatis ab ea recedit.

LUZON, Prov. Bataan, mons Mariveles, alt. 1,200 m, *For. Bur. 2393 Borden:* Prov. Batangas, *Copeland 264, For. Bur. 7823, 7837 bis Curran & Merritt.* Ad truncos arborum.

4. S. PULVINATA (Mey. & Flot.) Wain.

Cephalodiis arbusculaeformibus, brevibus a *S. carpolomoide* Nyl. differt. Thallus subtus pallidus, denudatus aut partim rhizinis brevibus increbris aut rarius sat crebris obductus, cephalodiis mediocribus aut latis instructus, basi breviter stipitatus. Gonidia pleurococcacea. Huc etiam pertinet coll. Vieillard no. 1798 e Nova Caledonia et planta in Manila a Gaudichaud lecta, disco apotheciorum fusco et sporis "long. 0.32–0.34, crass. 0.009–0.011 mm, 3-septatis" instructa secundum annotationem Nylanderi (no. 3366 in herb. Nyl.). In specimine orig. *S. carpolomoidis* Nyl., in Java a Korthals lecto (no. 33664 in herb. Nyl.), thallus isidiis destitutus, subtus rhizinis brevibus, crebris fuscescenti-pallidis obductus.

LUZON, Prov. Bataan, mons Mariveles, *Merrill 6285a.* MINDANAO, Dist. Zamboanga, 700 m alt., *Copeland "F."* Ad truncos arborum.

5. S. TRICHOPHORA Wain. sp. nov.

Thallus sat increbre dichotome repetito-laciniatus, laciniis sublinearibus, 7–4 mm latis, apicibus obtusis aut subtruncatis, axillis latis, rotundatis aut obtusis, superne sat laevigatus, pallidus aut glaucescenti-pallidus, sat opacus, apices versus breviter albido-tomentosus aut pubescens, sorediis isidiisque destitutus, haud stipitatus, KHO nec superne nec intus reagens, subtus fuscescens

et ambitum versus pallescens, rhizinis concoloribus, sat brevibus, crebris obductus aut partim etiam denudatus, cyphellis mediocribus, albis, haud profundis, partim pseudocyphelliformibus. Apothecia marginalia aut parcius etiam supra thallum sparsa, 1.7–mm lata, disco rufo nitido aut opaco, concavo aut plano, margine crassitudine mediocri aut sat tenui, prominente, integro, excipulo extus piloso, gonidia parce in basi apothecii continente. Hypothecium pallidum. Epithecium testaceo-rufescens. Sporae 8-nae, distichae, rufescentes, fusiformes, apicibus sat obtusis, 1-septatae, septo tenui, long. 0.018–0.022, crass. 0.007–0.008 mm. Gonidia nostocacea. Habitu omnino similis *S. damaecorni* (Sw.) Ach. var. *rudiusculae* Wain., cujus gonidia pleurococcacea, saepe bicellulosa aut glomerulosa. Ad speciem nostram forsan pertinet *Stictina quercizans* var. *trichophora* Muell.-Arg. Lich. Beitr. no. 238.

MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1304*. Ad truncos arborum.

6. S. AMBAVILLARIA (Bor.) Del.

Thallus laevigatus aut impresso-punctatus, ciliis marginalibus, albidis, brevibus instructus aut ciliis et isidiis destitutus, haud stipitatus, subtus pallidus aut albidus, tomento crebro, concolore (aut raro denudatus, var. *papyrina* Nyl.). Apothecia excipulo piloso, gonidia in basi continente. Sporae fusiformes, decolores, 3-septatae, long. 0.034–0.036, crass. 0.005 mm. Gonidia nostocacea. Huc etiam pertinent *S. Lenormandii* (v. d. Bosch) Nyl. et *S. impressula* Nyl.

LUZON, Subprov. Benguet, Baguio, alt. 1,400 m, *Bur. Sci. 11994 p. p. Robinson*. Ad truncos arborum.

7. S. FIMBRIATA Schaer.

Thallus margine ciliatus, ciliis 1–0.5 mm longis, nigris, simplicibus, isidiis destitutus, subtus fuscescens aut ambitum versus pallescens ochraceusve, rhizinis concoloribus, brevibus, crebris aut partim denudatus, cyphellis mediocribus aut parvis, profundis, basi stipitatus. Apothecia supra thallum sparsa, 2.5–1.5 mm lata, sat tenuia, disco fusco aut rufo, margine tenui aut sat tenui, integro, excipulo leviter verruculoso aut sat laevigato, glabro, gonidiis destituto. Gonidia nostocacea.

LUZON, Subprov. Benguet, Baguio, 1,500 m alt., *Merrill 4889*. MINDORO, mons Halcon, *Merrill 6195*. MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1316 p. p.*

8. S. DUPLOLIMBATA (Hue) Wain.

Thallus margine ciliatus, ciliis 10.5 mm longis, nigris, simplicibus, et isidiatus, isidiis brevibus, tenuibus, interdum tantum parce evolutis, subtus fuscescens aut maxima parte pallidus, rhizinis concoloribus, brevibus, crebris, aut raro partim denudatus, cyphellis profundis, mediocribus, parvis aut latis, basi stipitatus. Apothecia supra thallum sparsa, 3.5–2 mm lata, sat tenuia, disco plano, rufo aut fusco aut testaceo, margine tenui aut sat tenui, integro aut verruculoso-crenulato, excipulo sat laevigato aut leviter verruculoso, glabro, gonidiis destituto. Hypothecium pallidum. Epithecium pallescens aut lutescens aut rufescens. Sporae 8-nae, distichae, fusiformes, apicibus sat acutis, demum 3-septatae, pallescentes, long, 0.038–0.040, crass. 0.009–0.010 mm. Gonidia nostocacea. Huc pertinet *S. ciliaris* f. *duplolimbata* Hue, Lich. Extra-Eur. no. 440, et proxime affinis est *S. fimbriatae,* quae tantum thallo isidiis destituto ab ea differre videtur. Ambae habitu et ramificatione thalli *S. ambavillariae* (Bor.) similes, at thallo stipitato ab ea distinguuntur.

LUZON, Subprov. Bontoc, 1,500 m alt., *Vanoverbergh 784:* Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 8596 McGregor;* mons Pulog, *Bur. Sci. 8958, 8961 McGregor:* Prov. Batangas, *For. Bur. 7837 bis p. p. Curran & Merritt.* MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1309:* Dist. Zamboanga, 1,000 m alt., *Merrill 8345.* **Ad truncos.**

9. S. LINGULATA Wain. sp. nov.

Thallus increbre aut sat increbre dichotome repetito-laciniatus, laciniis sublinearibus, 12–2 mm latis, apicibus obtusis aut rotundatis, axillis latis, obtusis, superne laevigatus, planus aut basin versus canaliculatus, cinereus aut raro apices versus pallescens, sat opacus, glaber, isidiis marginalibus, minutissimis aut raro 2 mm longis, vulgo tenuissimis, obscure cinereis, parcissimis aut abundanter evolutis instructus, sorediis et ciliis marginalibus destitutus, KHO nec superne nec intus reagens, subtus fuscescens aut ambitum versus pallescens, rhizinis fuscescentibus, brevibus, crebris obductus aut ambitum versus aut raro totus denudatus, basin versus costatus, cyphellis minutis, profundis, saepe pallido-marginatis, margine prominente, stipite brevi aut sat brevi instructus. Gonidia nostocacea. Huc pertinet *"Stictina strictula"* Nyl. e Madagascaria (33855), sed haud specimen originale Delisei.

MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1310:* Subprov. Butuan, alt. 320 m, *C. M. Weber 1392.* MINDORO, prope flumen Alag, *Merrill 5497 p. p.*

10. S. MARGINIFERA Mont.

Thallus irregulariter laciniatus lobatusque, lobis cuneatis, latere sinuatis, apice iterum lobatis et lobato-crenatis, superne flavescens aut flavido-glaucescens aut pallescenti- vel fuscescenti-variegatus, isidiis brevibus, tenuibus, obscure cinereis, crebris aut parcis marginatus, sorediis et ciliis destitutus, subtus sordide pallescens aut fuscescens, rhizinis concoloribus, brevissimis, crebris obductus aut partim denudatus, basin versus costatus, cyphellis parvis aut parce etiam mediocribus, profundis instructus, basi breviter stipitatus. Gonidia nostocacea. Apothecia supra thallum sparsa, 1.5–3.5 mm lata, sat crassa aut crassitudine mediocria, disco fusco aut fusco-nigro, margine crassitudine mediocri aut sat tenui, crebre radiatim fisso aut subintegro, excipulo glabro, sat laevigato, gonidiis destituto. Hypothecium dilute pallido-rufescens. Epithecium pallido-rufescens. Sporae 8-nae, distichae, dilute pallidae, diu 1-septatae, demum 3-septatae, long. 0.045, crass. 0.012 mm. Thallo margine isidioso secundum specimen originale no. 33790 in herb. Nyl. cum hac specie congruit *S. filicinella* Nyl., quae autem thallo subtus distinctissime nervoso differt.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 8577, 8609 McGregor;* mons Pulog, *Bur. Sci. 8946 McGregor, For. Bur. 16381 Curran, Merritt, & Zschokke;* mons Tonglon, *For. Bur. 11069 Whitford p. p.:* Subprov. Lepanto, *For. Bur. 16027 Bacani;* mons Data, alt. 2,200 m, *Merrill 4946.* MINDANAO, Dist. Davao, mons Apo, alt. 1,900 m, *Copeland 1087.* In arboribus.

11. S. ORBICULARIS (Mey. & Flot.) Wain.

Var. PALLESCENS Wain.

Thallus saepe suborbicularis et subinteger aut parum lobatus, margine isidiosus, isidiis brevibus tenuibusque, obscure cinereis, subtus sordide pallescens, rhizinis concoloribus, brevissimis, crebris aut sat crebris obductus, cyphellis inaequalibus, latis et mediocribus, breviter stipitatus. Gonidia nostocacea. Apothecia marginalia. *S. hypochra* Wain. thallo magis lobato, polyphyllino ab hac varietate differt.

LUZON, Prov. Pampanga, mons Arayat, *For. Bur. 19340 Curran.* MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1824.*

12. S. BOSCHIANA Mont.

Thallus isidiis destitutus, subtus pallidus, rhizinis concoloribus, brevissimis, crebris aut sat crebris obductus aut raro partim denudatus, breviter stipitatus, cyphellis minutis, prominentibus, margine nudis. Apothecia marginalia, margine integro, sat

tenui, excipulo glabro, laevigato, gonidiis destituto. Hypothecium dilute fuscescens. Epithecium pallido-rufescens. Sporae 8-nae, dilute fuscescentes, fusiformes, apicibus sat obtusis, 3-septatae, long. 0.040–0.044, crass. 0.01 mm. Gonidia nostocacea.

LUZON, Prov. Laguna, mons Banajao, *Bur. Sci. 9797 Robinson.* Ad truncum arboris.

13. **S. COPELANDII** Wain. sp. nov.

Thallus cuneatus, long. 25–20 mm, lat. 35–25 mm, bilobatus aut subdichotome laciniatus, lobis cuneatis, crenatis, superne pallidus aut pallido- vel fuscescenti-glaucescens, isidiis et ciliis destitutus, esorediatus, sat laevigatus, aut leviter scrobiculatus, KHO non reagens, subtus ochraceo-pallidus, rhizinis concoloribus, brevissimis crebre obductus, basin versus saepe sat distincte nervosus, breviter stipitatus, cyphellis latis aut mediocribus (1–0.5 mm latis) instructus. Gonidia nostocacea. Apothecia marginalia aut submarginalia, 1–3.5 mm lata, late adnata, crassitudine mediocria, disco fusco-nigro, vulgo opaco, plano, margine subintegro aut leviter fisso, excipulo sat laevigato, glabro, gonidiis destituto. Hypothecium dilute rufescens vel pallido-rufescens. Epithecium pallido-rufescens. Sporae 8-nae, distichae, pallidae aut dilute pallidae, fusiformes, apicibus sat acutis aut sat obtusis, diu 1-septatae, demum 3-septatae, long. 0.050–0.064, crass. 0.010–0.014 mm. A *S. Boschiana* praesertim cyphellis multo majoribus differt.

MINDANAO, Dist. Davao, mons Apo, 2,000 m alt., *Copeland 1087 p. p., 1090 p. p.* In arboribus.

14. **S. PLURISEPTATA** Wain. sp. nov.

Thallus in lobos cuneatos aut irregulares, circ. 30–25 mm longos, 30–15 mm latos, denuo lobatos aut crenatos partitus, superne cinereo-glaucescens aut obscure glaucescens, laevigatus, ciliis et isidiis et sorediis destitutus, KHO non reagens, subtus pallidus et centrum versus fuscescens, rhizinis longitudine mediocribus aut partim brevibus, obscuratis aut sordide pallescentibus, crebris aut partim rarescentibus, cyphellis latis aut mediocribus (1–0.5 mm latis), haud costatus, basi breviter stipitatus. Apothecia marginalia aut submarginalia, 1.5–3 mm lata, late adnata, crassitudine mediocria, disco nigricante aut fusco-nigro, opaco, plano, margine crenulato aut subintegro, excipulo sat laevigato, subtus breviter tomentoso, gonidiis destituto. Hypothecium testaceum aut rufescens. Epithecium pallidum aut rufescens. Sporae 8-nae, fusiformes, decolores aut dilute pallidae, 1-septatae aut demum 5-septatae, long. 0.058–0.066, crass. 0.012–0.013 mm.

Affinis *S. dilatatae* (Nyl.) Wain., quae secund. specim. orig. in coll. Lindig. no. 1236 thallo stipitato, isidiis destituto, pilis marginalibus, penicilliformibus, cinereis ornato, apotheciis supra thallum sparsis, glabris, differt a *S. tomentosa* Sw., quae thallo ciliis et isidiis et stipite destitutus, subtus obscuris aut pallidis, apotheciis parvis, primum tomentosis, demum glabris secundum specim. orig. in herb. Ach. instructa est.

LUZON, Subprov. Benguet, mons Pulog, *Merrill 6468.* Ad truncum arboris.

3. LOBARIA Schreber

1. L. MERIDIONALIS Wain.

Thallus sat irregulariter iteratim lobatus et laciniatus, subpendulus, apicibus vulgo obtusis; axillis rotundatis aut obtusis, superne reticulato-costatus scrobiculatusque, fusco-pallescens aut pallido- vel cinereo-glaucescens, vulgo nitidus, sorediis destitutus, costis et margine plus minusve isidiosis, intus albus et KHO leviter fulvescens, subtus dilute pallidus aut albidus aut canalibus inter bullas denudatas rufescentibus fuscescentibusve et tomentosis, tomento brevi, pallido aut rufescente aut fuscescente aut nigricante, ex hyphis laxe adhaerentibus, apice liberis formato. Gonidia pleurococcacea, simplicia. Apothecia marginalia et supra laminam sparsa, 2–4 mm lata, elevata, basi bene constricta, substipitata aut sessilia, cupuliformia aut applanata aut raro convexa, disco rufo aut fusco aut pallido, nitido aut raro opaco, margine sat tenui aut demum excluso, integro, excipulo tessellato-verruculoso, pallido aut testaceo, glabro, gonidia infra stratum corticale continente, margine gonidiis destituto. Hypothecium pallidum. Epithecium pallidum aut testaceum aut rufescens. Sporae 8-nae, distichae, decolores aut dilute pallidae, fusiformes, apicibus sat obtusis, 3-septatae, long. 0.021–0.033, crass. 0.008–0.011 mm. Conidangia thallo immersa. Huc partim *S. pulmonaria* var. *papillaris* auctorum p. p. pertinet, at *Lobaria pulmonaria* (L.) Hoffm. sporis vulgo 1-septatis et thallo semper sorediosо, isidiis destituto aut simul sorediosо et isidioso (var. *papillaris* Del.) a *L. meridionali* differt.

LUZON, Subprov. Abra, *Bur. Sci. 7301 Ramos:* Subprov. Bontoc, *Vanoverbergh 393:* Subprov. Lepanto, mons Data, alt. 2,250 m, *Merrill 4952, 4985:* Subprov. Benguet, *Merrill 7932,* 1,500 m alt., *For. Bur. 15901 Bacani, Bur. Sci. 3380 Mearns, Bur. Sci. 13511 Ramos;* Baguio, 1,440 m alt., *Bur. Sci. 14008 Robinson;* Pauai, alt. 2,100 m, *Bur. Sci. 8626 McGregor;* mons Pulog, *Merrill 6464, 6465, 6466, 6467, For. Bur. 16380 Curran, Merritt, & Zschokke;* mons Tonglon, *Bur. Sci. 5495 Ramos.* MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1318.* Ad truncos arborum.

2. L. ISIDIOSA (Muell.-Arg.) Wain.

Thallus irregulariter lobatus laciniatusque, subpendulus, apicibus saepe subtruncatis, superne olivaceo- aut pallido- aut fusco- aut cinereo-glaucescens aut obscure virescens, vulgo leviter nitidus, reticulato-costatus scrobiculatusque, in rugarum jugis et in marginibus isidiosus, isidiis linearibus, cylindricis aut rarius applanatis, sorediis destitutus, intus albidus, nec KHO nec $CaCl_2O_2$ reagens, subtus pallidus aut subalbidus et canalibus inter bullas glabras pallidis aut rufescentibus aut fuscescentibus, ambitum versus denudatis, ceterum crebre tomentosis, tomento brevi, nigricante aut fuscescente, penicillato, ex hyphis laxe cohaerentibus, apice liberis formato, vulgo etiam rhizinis filiformibus, 2–7 mm longis, ex hyphis arcte connatis formatis, pallidis aut fuscescentibus aut nigricantibus, simplicibus aut ramosis, glabris aut breviter squarroso-tomentosis, saepe aggregatis, in canalibus aut bullis affixis instructus. Gonidia nostocacea. Apothecia supra laminam thalli sparsa, parce etiam marginalia, 3.5–1 mm lata, sessilia, haud elevata, vulgo applanata, disco rufo aut fuscescente, nitido aut raro opaco, margine tenui, integro, pallido aut fuscescente, excipulo tessellato-verruculoso, tomentoso aut glabro, gonidia solum in basi infra stratum corticale continente. Hypothecium pallidum. Epithecium rufescens. Sporae 8-nae, distichae, decolores, fusiformes, apicibus obtusis, 3-septatae, long. 0.028–0.030, crass. 0.007–0.011 mm. Conidangia thallo immersa. *Stictina retigera* f. *isidiosa* Muell.-Arg. Lich. Beitr. no. 393, huc pertinet.

LUZON, Subprov. Benguet, *Bur. Sci. 5876 Ramos, For. Bur. 15772 Curran;* Pauai, alt. 2,250 m, *Bur. Sci. 4431, 4546 Mearns, Bur. Sci. 8537, 8594* (f. *sphyridioides* Wain., isidiis morbose rufo-capitatis), *8626 McGregor;* mons Pulog, *Merrill 6470, Bur. Sci. 8926, 8966 McGregor.* In arboribus.

3. L. RETIGERA (Bor.) Wain.

Thallus irregulariter aut iteratim dichotome lobatus laciniatusque, subpendulus, apicibus saepe subtruncatis, superne pallido- aut olivaceo-glaucescens, leviter nitidus, reticulato-costatus scrobiculatusque, sorediis et isidiis destitutus, intus albidus, nec KHO nec $CaCl_2O_2$ reagens, subtus pallidus et canalibus inter bullas glabras pallidis aut rarius demum rufescentibus, ambitum versus denudatis, ceterum crebre tomentosis, tomento brevi, nigricante, penicillato, ex hyphis laxe cohaerentibus, apice liberis formato, etiam rhizinis filiformibus, 1–4 mm longis, ex hyphis arcte connatis formatis, pallidis aut fuscescentibus aut nigricantibus, vulgo subsimplicibus, glabris aut breviter squarroso-tomentosis, saepe aggregatis, in canalibus aut bullis affixis in-

structus. Gonidia nostocacea. Apothecia supra laminam thalli sparsa, parce etiam marginalia, 2.5–1 mm lata, sat elevata, basi bene constricta, substipitata aut sessilia, primum cupuliformia, dein mox applanata, disco rufo aut fuscescente, nitido aut opaco, margine tenui, subintegro, fuscescente aut subpallido, excipulo tessellato-verruculoso, subglabro aut glabro, primum in basi gonidia continente, demum gonidiis destituto, stipite gonidia continente. Hypothecium pallidum aut rufescenti-pallidum. Epithecium rufescens aut pallidum. Sporae 8-nae, distichae, decolores aut pallidae, fusiformęs, apicibus obtusis aut sat acutis, demum 3-septatae, long. 0.026–0.030, crass. 0.007–0.010 mm. Thallo isidiis destituto et apotheciis magis elevatis, demum gonidiis destitutis a *L. isidiosa* (Muell.-Arg.) differt.

MINDORO, mons Halcon, *Merrill 6110.* MINDANAO, Prov. Misamis, mons Malindang, *For. Bur. 4808 Mearns & Hutchinson.* Ad truncos arborum.

4. L. ASIATICA Wain. sp. nov.

Thallus irregulariter lobatus, adpressus, superne olivaceo-pallido- et pallido-fuscescenti-variegatus, subtus late nigricans, rhizinis concoloribus, tomento subcontinuo aut partim abrupto, ex hyphis laxe cohaerentibus formato, rhizinis longioribus abundanter immixto superne et intus nec KHO nec $CaCl_2O_2$ reagens, at his reagentiis unitis intus rubescens. Gonidia pleurococcacea. Apothecia supra laminam thalli sparsa, parmelioidea, cupuliformia, 3–6 mm lata, sessilia, disco concavo aut demum applanato, rufo aut fusco, margine elevato aut inflexo, sat tenui, saepe demum anguste thallino-dilatato, integro aut demum parce thallino-lobato, excipulo laevigato, glabro, gonidia infra stratum corticale continente, thallo concolore. Hypothecium pallidum. Epithecium pallido-rufescens. Sporae 8-nae, polystichae, decolores aut demum pallidae, fusiformes, apicibus sat acutis, diu 1-septatae, demum 3-septatae, long. 0.05–0.06, crass. 0.008 mm. Conidangia demum verrucas hemisphaericas formantia. Ramificatione thalli et apotheciis similis est *L. herbacea* (Huds.), at thallo subtus late nigricante rhizinisque concoloribus ab ea differens. Sporis longioribus 3-septatisque et margine apotheciorum saepe thallino-dilatato a *L. intermedia* (Nyl.) distinguitur.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 8535 McGregor;* mons Pulog, *Merrill 6447;* mons Tonglon, *Bur. Sci. 5479 Ramos.* Ad truncos arborum.

5. L. PHILIPPINA Wain. sp. nov.

Thallus subdichotome sat crebre iteratim laciniatus, apicibus saepe subtruncatis aut rotundato-obtusis, axillis sat latis aut angustis, rotundatis aut obtusis, adpressus, superne leviter scrobiculato-inaequalis, pallido-fuscescenti- et olivaceo-pallido-variegatus, leviter nitidus, sorediis et isidiis destitutus, intus albidus, superne et intus nec KHO nec $CaCl_2O_2$ reagens, at his reagentiis unitis intus rubescens, subtus pallidus aut medio demum nigricans, subcontinue aut partim sparse tomentosus, tomento brevi, crebro aut partim increbro, fuscescente aut nigricante aut ambitum versus pallido, margines et apices versus partim inaequaliterque denudatus, rhizinis longioribus crassioribusque passim parceve instructus. Gonidia pleurococcacea. Apothecia submarginalia et partim supra laminam thalli sparsa, 3–8 mm lata, sessilia, sat applanata aut rarius primum cupuliformia, disco rufo aut fusco, margine mediocri aut sat tenui, subintegro aut raro subcrenulato, haud thallino-dilatato, excipulo glabro, laevigato aut tessellato-verruculoso aut demum scrobiculato, gonidia infra stratum corticale continente, thallo concolore. Hypothecium pallidum. Epithecium rufescens. Sporae 8-nae, distichae, pallidae, fusiformes, apicibus sat acutis aut rarius obtusis, diu 1-septatae, demum 3-septatae, long. 0.031–0.042, crass. 0.009–0.011 mm. Conidangia thallo immersa. Tomento thalli similis est *Lobariae Schaereri*. *L. intermedia* (Nyl.) rhizinis majoribus, sporis 2-septatis et habitu *L. herbaceae* ab ea recedit. *L. americana* Wain. lobis thalli rotundatis et rotundato-crenatis et sporis acicularibus ab ea distinguitur. *L. patinifera* (Tayl.) isidiis vel "gemmis marginalibus subrotundis, planis" thalli et "thallo albido" ab his omnibus differt.

MINDANAO, Dist. Davao, mons Apo, 1,900 m alt., *Copeland 1149, 1088.* Ad truncos arborum.

6. L. STICTAEFORMIS (Schaer.) Wain.

Parmelia stictaeformis Schaer. in Moritzi Syst. Verzeichn. (1846) 128.
Sticta Schaereri Mont. & v. d. Bosch, Lich. Jav. (1856) 14.
Lobaria Schaereri Hue, Lich. Jav. (1901) 181 p. p.

Thallus irregulariter aut subdichotome crebre iteratim laciniatus lobatusque, apicibus saepe subtruncatis aut rotundato-obtusis, axillis sat angustis, rotundatis aut obtusis et lateribus conniventibus, adpressus, superne sat laevigatus, saepe late canaliculatus, albido- aut pallido-glaucescens, KHO lutescens et

addito $CaCl_2O_2$ intus rubescens, subtus pallidus et centrum versus et medio laciniarum nigricans aut fuscescens et ibi tomento brevi, crebro aut partim disperso, nigricante aut fusco instructus, apices et saepe margines versus denudatus, rhizinis longioribus parcis aut nullis, sorediis et isidiis destitutus, laciniis 3–15 mm latis. Apothecia marginalia aut submarginalia, 3–6 mm lata, elevata, subpedicellata, cupuliformia aut demum applanata, disco rufo, margine sat tenui, subintegro aut rugoso, haud thallino-dilatato, excipulo laevigato aut verruculoso, glabro, thallo concolore, gonidia pleurococcacea usque ad marginem continens. Hypothecium pallidum. Epithecium pallidum aut rufescenti-pallidum. Sporae 8-nae, distichae, dilute pallidae, fusiformes, apicibus sat acutis aut obtusis, 1–3-septatae, long. 0.025–0.042, crass. 0.009–0.010 mm. Conidangia submarginalia, thallo immersa, haud prominentia, ostiolo nigro indicata.

LUZON, Subprov. Benguet, *For. Bur. 15902 Bacani, F. Sanchez 14.* MINDANAO, Subprov. Butuan, vallis Agusan, *For. Bur. 7584 Hutchinson.* Ad truncos arborum.

7. **L. FERAX Wain. sp. nov.**

Thallus irregulariter aut subdichotome crebre iteratim laciniatus lobatusque, laciniis 2–40 mm latis, apicibus rotundato-crenatis aut subtruncatis rotundatisve aut obtusis, axillis angustis aut sat angustis, rotundato-obtusis aut rotundatis et lateribus conniventibus, adpressus, superne sat laevigatus aut leviter inaequalis, albido- aut pallido-glaucescens, KHO lutescens et addito $CaCl_2O_2$ intus rubescens, subtus albido-pallescens aut pallidus aut centrum versus partim fuscescens vel pallido-fuscescens, tomento brevi, disperso, sordide pallescente aut nigricante et rhizinis longioribus sparsis aut aggregatis, numerosis aut parcissimis instructus, ambitum versus plus minusve late denudatus, sorediis et isidiis destitutus. Apothecia supra laminam thalli sparsa, 2.5 mm lata, sessilia, applanata aut raro praesertimque primum cupuliformia, disco rufo, margine sat tenui aut mediocri, saepe crenulato aut verrucoso aut subintegro, haud thallino-dilatato, excipulo vulgo verruculoso, glabro, thallo concolore. Hypothecium pallidum. Epithecium pallidum. Sporae 8-nae, distichae, dilute fuscescentes vel pallidae, fusiformes, apicibus acutis aut rarius obtusis, 1–3-septatae, long. 0.022–0.055, crass. 0.008–0.012 mm. Conidangia supra laminam thalli sparsa, saepe leviter prominentia, ostiolo nigricante instructa. *L. Schaereri* auctorum huc pro parte pertinet, at *L. ferax* apotheciis

centralibus, sessilibus et conidangiis centralibus ab *L. stictaeformi* facile distinguitur.

Var. **GENUINA** Wain.

Thallus laciniis circ. 3–10 mm latis. Sporae 1–3-septatae, long. 0.025–0.052, crass. 0.008–0.011 mm. Ramificatione thalli similis *L. stictaeformi.*

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 8532, 8533, 8539, 8558, 8576, 8583, 8597 p. p. McGregor;* mons Pulog, *Bur. Sci. 8928, 8939, 8948 McGregor, For. Bur. 16358 Curran, Merritt, & Zschokke;* mons Tonglon, *Bur. Sci. 5491 Ramos.* Ad truncos arborum.

Var. **SUBSINUOSA** Wain.

Thallus laciniis circ. 15–40 mm latis. Sporae 1–3-septatae, long. 0.040–0.055, crass. 0.008–0.010 mm. Ramificatione thalli subsimilis *Stictae sinuosae* Pers. et *Lobariae platylobae* (Nyl.), quae posterior thallo subtus albido rhizinisque albidis (et sporis 1-septatis) ab ea differt.

LUZON, Subprov. Benguet, Pauai, *Bur. Sci. 8581 McGregor;* mons Pulog, *Merrill 6471;* mons Tonglon, *Merrill 7961.* MINDORO, mons Halcon, alt. 1,800 m, *Merrill 5523.* Ad truncos arborum.

Var. **STENOPHYLLODES** Wain.

Thallus laciniis circ. 2–5 (–10) mm latis, axillis latioribus. Apothecia 1.5–2.5 mm lata. Sporae pallidae, fusiformes, apicibus obtusis aut acutis, diu 1-septatae, raro demum 3-septatae, long. 0.022–0.040, crass. 0.010–0.012 mm. *Lobariam Fendleri* (Mont.) in memoriam revocans.

LUZON, Subprov. Benguet, Baguio, 1,450 m alt., *Merrill 4941.* Ad frutices.

8. **L. SUBSCROBICULATA** Wain. sp. nov.

Thallus irregulariter aut subdichotome sat crebre iteratim laciniatus lobatusque, laciniis 7–25 mm latis, apicibus rotundato-lobatis, axillis sat angustis, rotundato-obtusis aut rotundatis, lateribus conniventibus, adpressus, superne subreticulato- et impresso-rugosus, albido-glaucescens, KHO bene lutescens, intus non reagens, at addito $CaCl_2O_2$ intus rubescens, subtus albido-pallescens, tomento brevi, crebro aut partim disperso, sordide pallescente et centrum versus cinereo-fuscescente instructus, pustulis vulgo denudatis, ambitum versus late denudatus, rhizinis longioribus parcissimis, sorediis et isidiis destitutus. Conidangia supra laminam thalli sparsa, immersa aut raro verruculam formantia, ostiolo nigro aut fuscescente. *Ricasolia*

subdissecta f. *scrobiculata* Nyl. in Flora (1864) 618 secund. specim. orig. tomento nigro, margine apotheciorum haud thallino-dilatato et conidangiis thallo immersis instructa, etiam ramificatione thalli et habitu huic speciei est similis, at colore tomenti ab ea differt.

LUZON, Subprov. Bontoc, *Vanoverbergh 394*. Ad truncum arboris.

9. L. DISCOLOR (Bor.) Wain.

Thallus dichotome sat crebre iteratim laciniatus, laciniis circ. 12–3 mm latis, apicibus vulgo subtruncatis aut obtusis aut rotundatis, axillis rotundatis, sat latis, lateribus conniventibus, adpressus, superne sat laevigatus, saepe leviter late canaliculatus, pallide cinereo-glaucescens, KHO non reagens, at addito $CaCl_2O_2$ intus rubescens, subtus pallescens, subglaber et tomento destitutus, rhizinis nonnullis, subsimplicibus instructus, sorediis et isidiis destitutus. Apothecia submarginalia et supra laminam thalli sparsa, elevata, sessilia aut subsessilia, 2–3.5 mm lata, primum cupuliformia, demum applanata, disco rufo, margine sat tenui, integro, haud thallino-dilatato, demum saepe tessellato-diffracto, excipulo glabro. Hypothecium pallidum. Epithecium pallidum. Sporae 8-nae, distichae, pallidae, fusiformes, apicibus acutis aut raro obtusis, 1–3-septatae, long. 0.022–0.036, crass. 0.009–0.011 mm. Conidangia marginalia et supra laminam thalli sparsa, haud aut raro leviter prominentia, ostiolo nigricante instructa. Reactionibus thalli cum specimine originali no. 33360 e Borbonia (in herb. Nyl.) congruens. Arn. Lich-Exs. 1693 thallo superne KHO lutescente, subtus maculis nigricantibus nigro-tomentosis instructo ab hac specie differt et nominetur *Lobaria Arnoldi* Wain.

LUZON, Prov. Pampanga, mons Arayat, *Merrill 3842*. Ad truncum arboris.

10. L. ROBINSONII Wain. sp. nov.

Thallus irregulariter laciniatus lobatusque, laciniis 12–3 mm latis, apicibus rotundato-crenatis, axillis angustis, lateribus conniventibus, adpressus, superne laevigatus, albido-glaucescens, superne et intus nec KHO nec $CaCl_2O_2$ reagens, subtus albido-pallescens, subglaber et tomento destitutus, rhizinis parcis, subsimplicibus instructus, sorediis et isidiis destitutus. Apothecia supra laminam thalli sparsa, adpressa aut sat elevata, sessilia, 2–3 mm lata, applanata aut primum cupuliformia, disco rufo, margine sat tenui, subintegro aut verruculoso, haud thallino-dilatato, excipulo sublaevigato, glabro. Hypothecium pallidum. Epithecium lutescenti-pallidum. Hymenium circ. 0.13 mm cras-

sum. Sporae 8-nae, distichae, pallidae, fusiformes, apicibus acutis, diu 1-septatae, demum 3-septatae, long. 0.032–0.058, crass. 0.007–0.009 mm. Conidangia marginalia et supra laminam thalli sparsa, bene prominentia, ostiolo nigricante instructa. Ramificatione thalli *Parmeliam tiliaceam* in memoriam revocans.

LUZON, Prov. Laguna, mons Banajao, *Bur. Sci. 9866 Robinson.* Ad truncum arboris.

11. L. INTERVERSANS (Nyl.) Wain.

Thallus irregulariter laciniatus lobatusque, laciniis 15–2 mm latis, apicibus rotundato-crenatis, axillis angustis, lateribus conniventibus, arcte adpressus, superne laevigatus, cinereo- aut pallido-glaucescens, KHO non reagens, at addito $CaCl_2O_2$ intus rubescens, subtus pallidus aut centrum versus demum fuscescens, rhizinis 2–0.2 mm longis subsimplicibus aut apice demum ramosis, pallidis aut fuscescentibus instructus, sorediis et isidiis destitutus. Apothecia supra laminam thalli sparsa, sessilia, 1.5–5 mm lata, applanata aut cupuliformia, disco fusco, margine tenui aut sat tenui, integro aut crenulato, excipulo laevigato, glabro. Hypothecium pallidum. Epithecium pallidum. Sporae 8-nae, pallidae, fusiformes, apicibus acutis aut rarius sat obtusis, 1–3-septatae, long. 0.034–0.064, crass. 0.006–0.010 mm. Conidangia supra laminam thalli sparsa, prominentia, ostiolo nigricante instructa. Cum specimine orig. hujus speciei, in insula S. Thomé in Guinea lecta, satis congruens.

LUZON, Subprov. Benguet, Pauai, *Bur. Sci. 4555 Mearns:* Prov. Cagayan, *For. Bur. 16801 Curran.* MINDORO, mons Halcon, *Merrill 6191 p. p.*

12. L. MACGREGORII Wain. sp. nov.

Thallus irregulariter laciniatus lobatusque, laciniis 15–3 mm latis, apicibus rotundato-crenatis, axillis angustis, lateribus conniventibus, adpressus et apicibus leviter adscendentibus, superne laevigatus, glaber, pallidus aut partim glaucescenti-pallidus, KHO non reagens, at addito $CaCl_2O_2$ intus rubescens, subtus pallidus aut centrum versus demum fuscescens, tomento nigricante, brevi, ramoso et rhizinis subsimplicibus aut squarroso-tomentosis, nigricantibus, numerosis obsitus, ambitu anguste denudatus, sorediis et isidiis destitutus. Apothecia supra laminam thalli sparsa, sessilia, 2–6 mm lata, cupuliformia, disco pallido-rufescente, margine tenui, subintegro aut leviter crenato, demum anguste thallino-dilatato, excipulo laevigato aut leviter verruculoso, glabro. Hypothecium pallidum. Epithecium pallidum. Sporae 8-nae, pallidae aut rufescenti-pallidae, fusiformes, apicibus acutis, 1–3 septatae, long. 0.032–0.040, crass. 0.007–0.010 mm.

Conidangia supra laminam thalli sparsa, verrucas conoideo-hemisphaericas formantia, apice mammillato, nigricante.

LUZON, Subprov. Benguet, Pauai, alt. circ. 2,100 m, *Bur. Sci. 8597 McGregor.* Ad truncum arboris.

13. L. INSULARIS Wain. sp. nov.

Thallus sat crebre iteratim dichotome laciniatus, laciniis circ. 11–3 mm latis, apicibus vulgo subtruncatis aut obtusis, axillis rotundatis, sat latis, lateribus conniventibus, prostratus, superne sat laevigatus, saepe leviter late canaliculatus, glaber, albido- aut cinereo- aut pallido-glaucescens, KHO non reagens, at addito $CaCl_2O_2$ intus rubescens, subtus pallidus et medium aut centrum versus laciniarum nigricans aut fuscescens, medio laciniarum aut partim subreticulatum tomento brevi, crebro, nigricante aut raro partim pallido (in no. 1301) obductus et rhizinis elongatis parcis interdum instructus, latere saepe glaber, ambitum versus interdum partim late denudatus, sorediis et isidiis destitutus. Apothecia supra laminam thalli sparsa aut partim marginalia, elevata, substipitata, cupuliformia aut applanata, 2–5 mm lata, disco rufo, margine mediocri, integro, excipulo tessellato-verruculoso, glabro. Hypothecium pallidum. Epithecium pallidum. Sporae 8-nae, distichae, fusiformes, apicibus acutis aut sat acutis, pallidae, 1–3-septatae, long. 0.022–0.042, crass. 0.009–0.014 mm. Conidangia marginem versus thalli sparsa, thallo immersa, ostiolo punctiformi, nigro indicata. Habitu subsimilis *L. marginatae* (Muell.-Arg.), at reactione thalli et tomento nigricante et sporis crassioribus ab ea differens. *L. Fendleri* (Mont.) tomento distinctius reticulato ab ea distinguitur.

LUZON, Subprov. Lepanto, *For. Bur. 16024 Bacani:* Prov. Bataan, mons Mariveles, *Copeland "N."* MINDANAO, Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1301.* Ad truncum arboris.

14. L. CLEMENSAE Wain. sp. nov.

Thallus sat irregulariter lobatus, lobis circ. 10–2 mm latis, margine partim anguste lacinulatus, lacinulis partim isidioideis, etiam lamina saepe partim isidiosa, adpressus, sat laevigatus, saepe partim late canaliculatus, superne glaucescens aut partim pallido-glaucescens, nec KHO nec $CaCl_2O_2$ nec his reagentiis unitis reagens, subtus pallidus et centrum versus fuscescens vel nigricans, fere totus tomentosus, tomento brevi, crebro, fuscescente vel nigricante aut ambitum versus partim pallido, zonam continuam formante, aut apices marginesque versus plus minusve late denudatus, rhizinis subsimplicibus, elongatis, parcis interdum instructus. *L. subcorrosa* (Nyl.) et *L. ad-*

scripta (Nyl.), thallo margine isidioideo lacinulato instructae, reactione thalli ab hac specie differunt. Diversa etiam est planta, nomine *Ricasoliae adscriptae* a Nyl. salutata, ex Japonia, thallo crassiore, margine haud isidioideo-lacinulato, dignota, quae nominetur *L. adscripturiens*, nam *R. adscripturiens* Nyl. ab ea non distinguenda est et "puncta alba pseudocyphelloidea," a Nyl. in thallo ejus observata, secundum specimen orig. in herb. Nyl. tantum rhizinae abruptae sunt.

MINDANAO, Subprov. Butuan, 320 m alt., *C. M. Weber 1385:* Dist. Lanao, Castra Keithley prope lacum Lanao, *Mary Strong Clemens 1315, 1316.* Ad truncum arboris. Ster.

15. **L. ALBIDOGLAUCESCENS** Wain. sp. nov.

Thallus irregulariter crebre laciniatus lobatusque, laciniis 10–2 mm latis, ambitu rotundato-crenatis, axillis angustis, vulgo acutis, adpressus, superne sat laevigatus, glaber, albido- vel cinereo-glaucescens, KHO lutescens, et addito $CaCl_2O_2$ intus rubescens, subtus pallescens aut centrum versus demum fuscescens, rhizinis subsimplicibus, sat brevibus crebris partim obductus, ambitum versus sat anguste denudatus, isidiis et sorediis destitutus. Apothecia supra laminam thalli sparsa, sessilia, cupuliformia aut sat applanata, 1.5–4 mm lata, disco rufo aut testaceo-rufescente, margine sat tenui, crenato aut rarius subintegro, saepe subinflexo, interdum demum anguste thallino-dilatato, excipulo minutissime verruculoso, glabro. Hypothecium pallidum. Epithecium rufescens aut pallido-rufescens. Sporae 8-nae, polystichae, aciculares, apicibus acutis aut sat acutis, decolores aut dilutissime pallidae, 3-septatae, long. 0.052–0.080, crass. 0.004–0.006 mm. Conidangia supra laminam thalli sparsa, verrucas hemisphaericas aut depresso-hemisphaericas formantia, ostiolo fusco-nigro, punctiformi, interdum leviter impresso. A *L. crenulata* conidangiis prominentibus, thallo superne laevigato, margine apothecium minus thallino-dilatato, sporis triseptatis distinguitur. *Ricasolia sublaevis* Nyl. thallo subtus subnudo ab iis differt.

LUZON, Subprov. Benguet, Pauai, alt. 2,100 m, *Bur. Sci. 8619, 8636 McGregor.* Ad truncos arborum.

ERRATA TYPOGRAPHICA, PARS I (Philip. Journ. Sci. **4** (1909) Bot.).

Fol. 652 lin. 7 inf. pro: *U. cinchonarum* lege: **U. cinchonarum.*
Fol. 653 lin. 8 inf. pro: *U. ciliata* lege: **U. ciliata.*
Fol. 659 lin. 4 sup. pro: **P. Clandelii** lege: **P. Claudelii.**
Fol. 662 lin. 13 inf. pro: *S. alpina* lege: *S. alpino.*
Fol. 662 lin. 11 inf. pro: *S. tomentosa* lege: *S. tomentoso.*

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NOTES ON SOME JAVAN FERNS

By EDWIN BINGHAM COPELAND

(From the College of Agriculture, University of the Philippines, Los Baños, P. I.)

Three plates

Through the courtesy of Mr. William R. Maxon of the United States National Herbarium and of the Curator of the Herbarium, Mr. F. V. Coville, a large collection of ferns made in Java by the Owen Bryant Expedition has been sent to me for determination. The collection was not made by botanists and naturally was not selected with the same skill and judgment that would have been possible on the part of men more familiar with these plants. Nevertheless the number of new species in proportion to the old is remarkably small for a collection in this part of the world, and speaks well for the thoroughness with which the Island of Java has been explored and its flora studied. An enumeration of these species would be of no interest, and accordingly only those which seem to be new or to suggest comments of real interest are mentioned here.

MARATTIA Swartz

MARATTIA TERNATEA de Vriese.

Mount Salak above Goenoeng Boender, alt. 1,200 m, *No. 453*.

Agrees satisfactorily with the description of Ternate specimens and with Philippine plants determined as this species.

CYATHEA Smith

CYATHEA GLABRA (Bl.) Copel.

No. 531, from the northern slope of Mount Salak, alt. 725 m.

This is peculiar in having the sori, even those of the lowest vein, almost costular; still I think the identification is correct.

CYATHEA SUBDIMORPHA Copel. sp. nov. Plate II.

Descriptio arboris caret. Adest pinna una, 45 cm longa, 16 cm lata, acuminata, rhachi atropurpurea, nitida, inerme, subtus glabrescente, supra velutina; pinnulis sterilibus usque ad 95 mm longis, 20 mm latis, pedicellatis, acuminatis, basi truncatis, deorsum pinnatis, rhachi subtus paleis angustis 1 mm longis brunneis sat dense vestita; pinnulis 2–6 paribus liberis, infimis non adnatis, 3–4 mm latis, ubique serrulatis, squamuliferis, venulis furcatis; pinnulis fertilibus usque ad 70 mm longis, 12–15 mm latis, magis pinnatis, pinnulis infimis brevi-stipitatis, coriaceis; soris costulae approximatis, confluentibus, exindusiatis.

Northwestern slopes of Mount Salak, alt. 900 m, *No. 468*.

Like other dimorphous species, such as *C. atropurpurea*, *C. Hewittii* and *C. biformis*, this has the color and pubescence of the *C. glabra* group.

HYMENOPHYLLUM Smith

HYMENOPHYLLUM PRODUCTUM Kze.

This is apparently quite common in Java, and is given by van Alderwerelt (Malayan Ferns, 69) as the Malayan form of his *H. demissum* Sw. It is unknown in the Philippines, where, as noted by Hooker [1] and by Christ,[2] a fern like the *H. demissum* of Polynesia and New Zealand occurs; and Christ states that this is in Celebes also. I cannot distinguish the two by size, but do so easily by the more pointed and toothed valves. The figures of Schkuhr and van den Bosch show the differences well.

HYMENOPHYLLUM HOLOCHILUM (v. d. B.) C. Chr.

No. 513, collected on tree base, northwestern slopes of Mount Salak, alt. 1,400 m.

This can be determined as diminutive forms of this species, or as *H. blandum* Racib. As is suggested by Raciborski, so it seems very probable to me, that the two are not distinct.

DRYOPTERIS Adanson

DRYOPTERIS ADNATA (Bl.) v. A. v. R. Malayan Ferns 191, excl. descrip.

No. 962, Mount Pangeranggo, alt. 3,000 m.

This fern agrees perfectly with Blume's diagnosis, but not with van Alderwerelt's amended description. The pinnae are rather obtuse and the pinnules oblong.

DRYOPTERIS SARAWAKENSIS (Baker) Copel.

Nephrodium sarawakensis Baker in Journ. Linn. Soc. Bot. 22 (1886) 225.

Aspidium intermedium Bl., non Willd.

As Christ has shown, Christensen is wrong in confusing this with *Nephrodium rhodolepis* Clarke. *Aspidium intermedium* Bl. is widespread, and

[1] Sp. Fil. 1: 109. [2] This Journal 2 (1907) Bot. 155.

reasonably variable, but appearing in the same characteristic forms in the whole Malayan region. *D. sarawakensis* is a form with exceptionally long and narrow fronds and blackish paleae; it is recognizable, but I think best not regarded as specifically distinct.

TECTARIA Cavanilles

TECTARIA GIGANTEA (Bl.) Copel.

Aspidium giganteum Blume, Enum. 159.

This belongs in the section "Cicutariae",[2] and is not nearly related to *Pleocnemia.*

ATHYRIUM Roth

ATHYRIUM PETERSENII (Kze.) Copel. comb. nov.

Asplenium Petersenii Kze. Anal. (1837) 24.

Near *A. japonicum* (Thunb.) Copel. in Philip. Journ. Sci. 3 (1908) Bot. 290.

ATHYRIUM PULCHERRIMUM Copel. sp. nov. Plate III.

Filix formosa A. nigripedi (Bl.) Moore affinis; stipite stramineo, 30 cm alto, deorsum paleis lanceolatis productis pallide brunneis usque ad 1 cm longis saepe deflexis sparsis vestito; fronde 30–40 cm alta, ovata, acuminata, tripinnata, rhachi nuda, pinnis infimis subdeflexis, sequentibus horizontalibus, usque ad 15 cm longis et 5 cm latis, plerisque imbricatis, brevipedicellatis, valde acuminatis, rhachibus viridi-castaneis; pinnulis imbricatis, brevistipitatis, oblongis, obtusis; pinnula II prima acroscopica maxima, orbiculari-oblonga, acute dentata; costis supra pilis sparsis donatis, lamina herbacea, glabra; soris costularibus, brevibus; indusio lato, saepe lacerato, brunneo.

JAVA, Mount Pangeranggo, alt. 2,950 m, *No. 990,* U. S. Nat. Herb. *No. 652520.*

The very uniform dissection of the ample frond gives this fern a strikingly attractive appearance.

ATHYRIUM SUBSCABRUM Copel. sp. nov. Plate IV.

Forsan Diplazium gregis A. Blumei (Bergsm.) Copel. minus dissectum; stipite 30 cm alto, valido, basi nigro, ubique sparse spinuloso et minute pulverulento; fronde ca. 50 cm alta, triangulari-ovata, tripinnatifida, rhachi straminea sparse echinulata; pinnis fere horizontalibus, subsessilibus, inferioribus 20 cm longis, 8 cm latis, oppositis, rhachibus subscabris, sursum alatis; pinnulis sessilibus, acutis, 15–20 mm latis, $\frac{2}{3}$ ad costas pinnatifidis, costis nudis; lobis 2–3 mm latis, oblique acutis, subintegris, lamina coriacea, glabra, infra vix pallidiore, soris usque

[2] This Journal 3 (1908) Bot. 410.

ad 3 mm longis, linearibus, fere omnibus ad venulas infimas et costae oblique positis, indusio tenue.

JAVA, Poentjak Pass, Megamendoeng Mountains, alt. ca. 1,480 m, *No. 1349*, U. S. Nat. Herb. *No. 652805*.

The position of this species is uncertain; it seems most likely to be a relative of *Diplazium asperum* Bl. The less dissected frond, with correspondingly long sori, suggest an immature plant; but it is fruiting freely, and juvenile specimens of the ferns of this group, as known to me, do not grow through such a stage as this.

ATHYRIUM PARIENS Copel. in Philip. Journ. Sci. 3 (1908) Bot. 299.

Mount Salak, alt. 1,600 m, *No. 631* in part. Already known from Mindanao and Negros.

This is very possibly identical with **ATHYRIUM FORBESII** (Baker) (*Asplenium Forbesii* Baker Ann. Bot. 5 (1891) 312).

ATHYRIUM SUBSERRATUM (Bl.) Milde.

The origin of this species with simple fronds on adult plants, from ancestors with compound fronds, is attested by the occurrence of bipinnatifid fronds on juvenile specimens. I have previously pointed out that the species with dissected fronds are the more primitive.[4]

The collection contains two other apparently new Athyria, but as the material is imperfect, they are not described.

PTERIS Linnaeus

PTERIS VENULOSA Bl. Enum. (1828) 209; Miq. Ann. Lugd. Bat. 1 (1868) 95.

Nos. 548, 682, 1044.

These and various other Javan specimens in Manila herbaria are very uniform, and constantly thoroughly distinct from *Pteris pellucida* Presl, of which our material is naturally ample. The differences are well given in the brief original diagnoses. *P. venulosa* has the axes red and polished, most of the leaflets decurrent-connected, leaflets broader, the sterile not wavy, much less acuminate, and coarsely crenate-serrate instead of finely and very sharply serrate toward the apex. Its veins are less conspicuous, but the hydathodes more so.

POLYPODIUM Linnaeus

POLYPODIUM JAVANICUM Copel. sp. nov.

Eupolypodium, stipite breve, 1 mm crasso, paleis castaneis lanceolatis vestito; stipitibus confertis exarticulatis, vix 1 cm longis, albido-velutinis; fronde pendente ca. 10 cm longa, 10–18 mm lata; obtusa, ad alam 1 mm latam pinnatifida; segmentis oblongis, abrupte subacutis, ca. 4 mm latis, integris, plerumque

[4] This Journal 3 (1908) Bot. 287.

imbricatis, crassis, minutissime pubescentibus; venis occultis; soris paullo immersis, submarginalibus, parvis, haud supra conspicuis.

Near Tjibodas, alt. 1,350–1,850 m, *No. 298*.

A relative of *Polypodium khasyanum* Baker, *P. barathrophyllum* Baker, and *P. negrosense* Copel., but easily distinguished from all by the close, usually imbricate segments.

EXPLANATION OF THE PLATES

(Photographs by Cortes)

PLATE II. *Cyathea subdimorpha* Copel. Sheet No. 651911, U. S. National Herbarium (type).

III. *Athyrium pulcherrimum* Copel. Sheet No. 652520 U. S. National Herbarium (type).

IV. *Athyrium subscabrum* Copel. Sheet No. 652805 U. S. National Herbarium (type).

PLATE II. CYATHEA SUBDIMORPHA Copel.

PLATE III. ATHYRIUM PULCHERRIMUM Copel.

PLATE IV. ATHYRIUM SUBSCABRUM Copel.

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ON PHYLLITIS IN MALAYA AND THE SUPPOSED GENERA DIPLORA AND TRIPHLEBIA

By EDWIN BINGHAM COPELAND

(From the College of Agriculture, University of the Philippines, Los Baños, P. I.)

Three plates

The genus *Diplora* was founded by Baker,[1] with the following diagnosis: "Genus *Diplora.* Sorus sausage-shaped, running up the erecto-patent simple vein from the midrib of the frond to its margin, the two equal narrowly strap-shaped valves of the superior membranous indusium meeting in the middle over the raised vein, and bursting open as the sorus matures." "Amongst familiar European types it is most like *Scolopendrium;* but here the sori reach uniformly from the midrib of the frond to its margin, and the pair of involucres, instead of springing from two contiguous veins and meeting in the interspace, spring from two sides of a single vein, and quite hide it until they burst open."

A woodcut, conforming exactly to the description, accompanies the original description. In Hooker's Icones [2] are four figures representing well the actual appearance; and two of these are worked over in the Natürlichen Pflanzenfamilien, [14] *Fig. 122, A, B.*

In examining a fern collected in Papua by the Reverend Copland King, which had been determined for him in Sydney as *Phyllitis mambare* (Bailey) (See Fig. 1), I found a condition which at first sight seemed to conform exactly to Baker's description and the figures; but a somewhat more careful study showed that the actual structure was entirely different, and quite like that of several ferns of the same region regarded as *Triphlebia* or *Phyllitis.* I showed these specimens, with the figures of *Diplora,* to several careful botanists, and they all agreed that the identity was complete; so that it immediately suggested itself that Baker had misinterpreted the structure of his *Diplora.*

[1] Baker, J. G. A New Genus of Ferns of the Tribe Asplenieae. *Journ. Bot.* 11 (1873) 235.

[2] Hook. Ic. III. 7: *pl. 1651.*

Examination of a fragment of the type, kindly loaned me by the Director of the Royal Botanic Gardens, Kew, showed that this was what had actually happened.

In reality, the essential structure of these ferns is exactly that of typical *Phyllitis* (*Scolopendrium*). The sorus is double, the sporangia springing from two veins, one on each side, separate back to the costa. This origin of the sporangia is clearly shown by a section across a sorus of the type specimen of *Diplora integrifolia*. These fertile veins are inconspicuous because the indusium and sporangia spring from and obscure them, and the sorus reaches down very nearly to the costa. In the European *Phyllitis Scolopendrium*, the sori are remote; but nobody would attach great importance to this character, and in Japanese specimens of the same species the sterile space at the base of the veins is sometimes exceedingly short.

As to the vein supposed by Baker to bear the sorus, there is a conspicuous raised line running down the middle of the sorus, and midway between the two fertile veins, but it is like the structures called spurious veins in some species of *Davallia* and *Angiopteris*, in that it does not originate in the costa, but at the lower end ends blindly in the tissue between the veins. Contrary to first appearance, and to the diagnosis of *Diplora*, it bears neither sporangia nor indusium. It is without vascular tissue.

Diplora as a genus therefore rests on characters which do not exist in nature, and the plants on which it was founded are typical *Phyllitis*. The second supposed species, *Diplora Cadieri* Christ, was promptly declared by its author [3] to be nothing more than a form of *Stenochlaena*.

The very closely related supposed genus, *Triphlebia*, is likewise invalid, resting on characters which are not diagnostic, as I discovered some time ago,[4] working with perfectly authentic specimens of the type species, though not with type specimens. I have now ample material of the original collections of Cuming. *Triphlebia* was described as distinguishable from *Phyllitis* by the position of the sorus, the indusia being borne as in *Phyllitis*, and by a raised crest where the halves of the indusium meet. The sporangia are in reality borne on the veins at the sides of the double sorus, as in *Phyllitis*. There is usually a raised line where the half-indusia meet, and another, as in *Diplora*,

[3] Verh. Schweizer. Naturf. Ges. (1906), Reprint (1907) 6.
[4] This Journal 1 (1906) 152.

under this on the surface of the frond; but neither of these is perfectly constant. And the raised line on the surface of the frond is found in typical *Phyllitis* as shown by *Fig. 3*. The entire area between the fertile veins is usually elevated in *Triphlebia;* but this would be a most inadequate generic character; and it is not constant in any group, nor wanting in typical *Phyllitis*. The chlorophyll is often relatively wanting in this area, as it is under large indusia of many ferns in several tribes, and the nether surface is usually concave in such cases.

At the lower end of the sorus of both *Diplora* and *Triphlebia,* the line of attachment of the indusium leaves the vein, and this contributes materially to the optical illusion as to the origin of the sorus. But there is nothing remarkable about this. It occurs in most or all of the related ferns, and in many of other groups (Cfr. *Athyrium, Davallia,* etc.).

Coming now to the species of these ferns, I am convinced that there has been no less of an unnecessary multiplication than there has in the genera.

Malay-Polynesian species of the group have been described in the following order:

Scolopendrium longifolium Presl, Rel. Haenk. 1 (1825) 48, *t. 9, f. 1.* From Luzon.

Scolopendrium Durvillei Bory, Dup. Voy. Bot. 1 (1828) 273. From Ualan. Referred by Hooker, Smith, Christensen, etc., to *Stenochlaena.*

S. pinnatum J. Smith (1841) name only; Kze. Farnkr. 1 (1843) 124. From the Philippines. Described from Camarines Sur; found from central Luzon to Mindanao, and reported in van Alderwerelt's Malayan Ferns from Borneo, Celebes and New Guinea. This is the type of *Triphlebia.*

Diplora integrifolia Baker in Journ. Bot. 11 (1873) 235. From the Solomon Islands.

Asplenium scolopendropsis F. Mueller, Papuan Plants 3 (1876) 49= *Phyllitis scolopendropsis* v. A. v. R. in Bull. Dept. Agric. Ind. Néerl. 21 (1908) 6. From New Guinea.

Asplenium Linza Cesati in Rend. Ac. Napoli (1876) = *Triphlebia Linza* Baker in Malesia 3 (1886) 42. From New Guinea.

Triphlebia dimorphophylla Baker in Malesia 3 (1886) 42. From New Guinea.

Scolopendrium Mambare Bailey in Queensland Agric. Journ. (1898) = *Phyllitis Mambare* v. A. v. R. Malayan Ferns, 478. From New Guinea.

Scolopendrium schizocarpum Copel. in Philip. Journ. Sci. 1 (1906) Suppl. 152 = *Phyllitis schizocarpa* v. A. v. R. Malayan Ferns, 479. From Mindanao.

Phyllitis intermedia v. A. v. R. in Bull. Dept. Agr. Ind. Néerl. 21 (1908) 6. From New Guinea.

Of these species and supposed species, *Diplora Cadieri* is known to me only by what Christ has published on it. *Phyllitis schizocarpa* (Copel.) v. A. v. R. is very distinct from any other. The remainder fall into two groups: one Philippine, whether or not confined to these Islands; the other in New Guinea and the islands of the southern Pacific.

The Philippine group contains one species, which must be called *Phyllitis longifolia* (Presl) O. Ktze. Various writers have expressed the suspicion that Presl's *Scolopendrium longifolium* is only a form of *S. pinnatum*. In this they are correct, but Presl's name is the older. In several spots near my home in Los Baños, the form with simple fronds is commoner than that with pinnate; but a search always reveals some pinnate ones, and in most localities, even in this neighborhood, pinnate fronds are the rule. Elsewhere in the Islands, only pinnate fronds have been collected. Haenke passed through this place, and may well have collected this fern here. There is not the least doubt that the local fern with simple leaves is the same as *Scolopendrium pinnatum*. The figure in Reliquiae Haenkeanae might as well represent a New Guinea plant, and specimens from that region have often been referred to this species; I have several Papuan specimens so identified. Local specimens are easily distinguished from any I have seen from New Guinea, but by characters, such as texture and color of frond and indusium, which are easily lost in an illustration. Ours is distinctly a fleshy fern, growing on very moist soil and rocks near streams, but never in my experience rising to places as dry as the trunks of trees.

Of the New Guinea-Polynesian group, I have in hand several specimens called *Scolopendrium longifolium,* which would better be determined as *Phyllitis intermedia;* fragments of *Triphlebia Linza* and *Phyllitis intermedia* v. A. v. R., kindly sent me by the author of the latter, Captain van Alderwerelt van Rosenberg; the type fragment of *Diplora integrifolia* already mentioned; and two good specimens, most diverse in appearance (*fig. 1, 2*), sent me by the Reverend Copland King with the note "Determined in Sydney as *Scolopendrium Mambare* Bailey." In spite of Mr. King's opinion to the contrary—and I appreciate the value of field knowledge and know that he knows his ferns well—I believe both determinations are correct. But one of these, the smaller, I could also determine as *Triphlebia dimorphophylla;* and Christ has already declared that this can be distinguished in no way from *Scolopendrium Durvillei.*

In some groups, slight differences are constant, and can well be used to distinguish species. In other groups, very conspicuous differences are inconstant, and therefore without any specific value. We are dealing with a group of the latter kind. Polymorphism is one of the alleged and supposedly diagnostic characters of some of the published species. Its failure to appear on a limited number of specimens supposed to represent other species is very poor evidence that it does not occur. I can collect specimens of *Asplenium epiphyticum* which will exhibit it or not, as I choose; collecting myself, I would make it evident, but some other collector, not knowing the fern, might very easily bring in a considerable number of specimens without any suggestion of it.

These ferns are not unstable in frond form alone. Even the characters used in founding genera, so far as they exist at all, are not invariable on single plants. The approximation of the halves of the sorus, and the line between them are inconstant. The latter character is under the influence of the former, at least to some extent; if the halves are far apart, they assume their character of independent sori, and the raised line is likely not to appear. And the approximation of the halves of the sorus is, at least to some extent, a function of the conditions under which the individual frond developed or plant grew. If the venation is lax, the half-sori are remote; then the plant is a *Phyllitis*. If the venation is dense, as it may be on the succeeding frond if the weather becomes less favorable, the half-sori must be closer together, and the plant may become *Triphlebia* or *Diplora*, according to the thoroughness with which it is examined. *Figs. 5* and *6* look very distinct from *Figs. 2* and *4*, and it is possible that they really represent distinct species; but the plant from which *Fig. 6* was made has another frond bearing sori almost as slender as those of *Fig. 2*.

Altogether, from the specimens I have and from the plates which have been published, and from my knowledge of related polymorphous and variable ferns, the best judgment I can reach is that these specimens and plates represent a single variable and polymorphous species; that *Diplora integrifolia* Baker, *Asplenium Linza* Cesati, *Triphlebia dimorphophylla* Baker, *Scolopendrium Mambare* Bailey, *Phyllitis intermedia* v. A. v. R., the New Guinea ferns called *Scolopendrium longifolium* Presl, and probably *Asplenium scolopendropsis* F. Mueller, all are more or less perfect specimens, more or less adult in characters,—the

more juvenile being more likely to reveal di- or polymorphism,—grown under conditions more or less favorable to luxuriant vegetation; and that the proper name to be given to all of these ferns is probably *Phyllitis Durvillei* (Bory) O. Ktze.

We can now take up the interesting question of the origin and relationships of the genus *Phyllitis*, including all these forms. Christ has already declared that a number of them (see p. 148) are merely juvenile forms of *Stenochlaena*. On the same evidence, he has treated my *Asplenium epiphyticum* in the same way. I feel sure that in this he goes too far. I have studied the *Asplenium* carefully in the field, and have found it always to remain an *Asplenium*. Its polymorphism is a juvenile character. With age, instead of proceeding to form pinnate fronds, as it should do if it were an immature *Stenochlaena*, it ceases to produce them, and finally bears only simple and fertile fronds. The evidence in the case of *Phyllitis Durvillei* is less complete, but all points in the same direction. The plants, as they mature, seem to grow away from polymorphism and partial sterility to complete fertility, with only simple fronds with the sori of *Phyllitis*.

While the similarity of life-history of *Asplenium epiphyticum*, *Phyllitis Durvillei*, and *Stenochlaena palustris* is utterly inadequate as evidence of their identity, it is the strongest kind of evidence they are closely related ferns. The three must have a rather recent common ancestry; and the *Asplenium* must be regarded as the one which has most completely retained the characters of this common ancestor. For, as between *Phyllitis* and *Asplenium*, the *Asplenium* has the simpler sorus, and represents a larger and more wide spread group; and the ancestor must be supposed to have been a fern with compound fronds, both on general grounds, such being the presumed common ancestry of all *Polypodiaceae*, and on the particular ground that these ferns develop through such a stage. The *Asplenium* has such relatives in its genus, while the *Phyllitis* has not. Of the three ferns, the *Stenochlaena* has departed most widely from the ancestral form, as is shown by the high degree of specialization reached after the common part of the life-history has been grown through.

Phyllitis Durvillei is accordingly to be regarded as descended from ferns of the genus *Asplenium*, its ancestor in that genus being *A. epiphyticum* or some very similar fern. And, this being so, it is also to be regarded as the most primitive species of *Phyllitis*.

If *Asplenium epiphyticum* bears a fertile vein on the lower side of the main vein, its sorus will face one in the normal position, and produce a double sorus of the type of *Phyllitis*. I have only once seen such a vein; the resulting fructification is shown in *Fig. 7*.

Asplenium epiphyticum is not only very near the common ancestor of *Phyllitis* and *Stenochlaena*, but it stands in the same position in regard to the simple-leaved group in its own genus, sometimes separated to form such genera as *Neottopteris* and *Thamnopteris*. This was first suggested to me by certain Bornean species, then new, which are intermediate in texture and general appearance between *Asplenium epiphyticum* and *A. squamulatum* and the *A. Nidus* group. Examination of the spores disclosed a remarkable common character, in the extreme spininess. This spininess is present in *Phyllitis Durvillei*, and is merely suggested in *Stenochlaena*.

SUMMARY

The genus *Diplora* is invalid, because founded on a misconception of the structure, the actual structure being that of *Phyllitis*.

The genus *Triphlebia* is invalid, because founded on inconstant "characters," and again in part on illusory ones.

Phyllitis, including the above, has only three well-defined species in the Malay-Polynesian region:

P. SCHIZOCARPA (Copel.) v. A. v. R.
P. LONGIFOLIA (Presl) O. Ktze.
P. DURVILLEI (Bory) O. Ktze.

The most primitive species of *Phyllitis* is *P. Durvillei*. It in turn is descended from *Asplenium*, from *A. epiphyticum* or some similar form.

Asplenium epiphyticum is an extant fern which very nearly represents stages in the ancestry of the genus *Phyllitis*, the genus *Stenochlaena*, and the *Nidus* group in *Asplenium*.

NOTE.—The connection of *Phyllitis* with *Asplenium*, and the explanation of the phylogeny of *Phyllitis*, so completely that the specific identity of the forms connecting them has been questioned, does not demand that the genus *Phyllitis* be given up. It is simply the realization, in one detail, of the general aim of the study of systematic biology and bionomics. We would still want to recognize genera and species, if the tree of life could be reproduced in every detail.

ILLUSTRATIONS

(Photographs by Cortes, all ten diameters)

PLATE V

FIG. 1. *Phyllitis Mambare* (Bailey) v. A. v. R., *King 287*. An evidently juvenile plant, but in full fruit.
2. *P. Mambare, King 366*. A much larger specimen.

PLATE VI

FIG. 3. *P. Scolopendrium* (L.) Newm. From Tivoli, ex herb. Lino Vaccari. The mid-soral line is evident.
4. *Triphlebia Linza* (Cesati) Baker, *Schlechter 14103*. The false mid-soral vein is evident in some but not in all sori. The same is true in *Fig. 5*.

PLATE VII

FIG. 5. *Phyllitis intermedia* v. A. v. R., *Versteeg 1014*.
6. The so-called *Triphlebia longifolia* of New Guinea, *King 191*.
7. *Asplenium epiphyticum* Copel. Showing an abnormal, basiscopic sorus, below which is a false vein, as in *Phyllitis*.

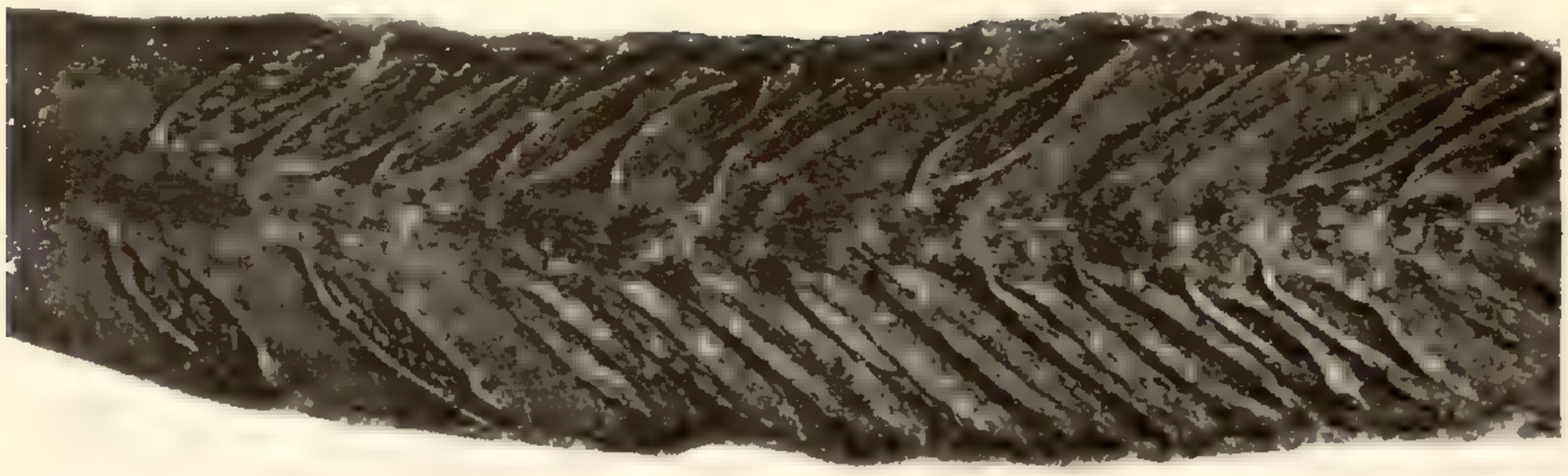

Fig. 1. *Phyllitis Mambare* v. A. v. R., a juvenile specimen.

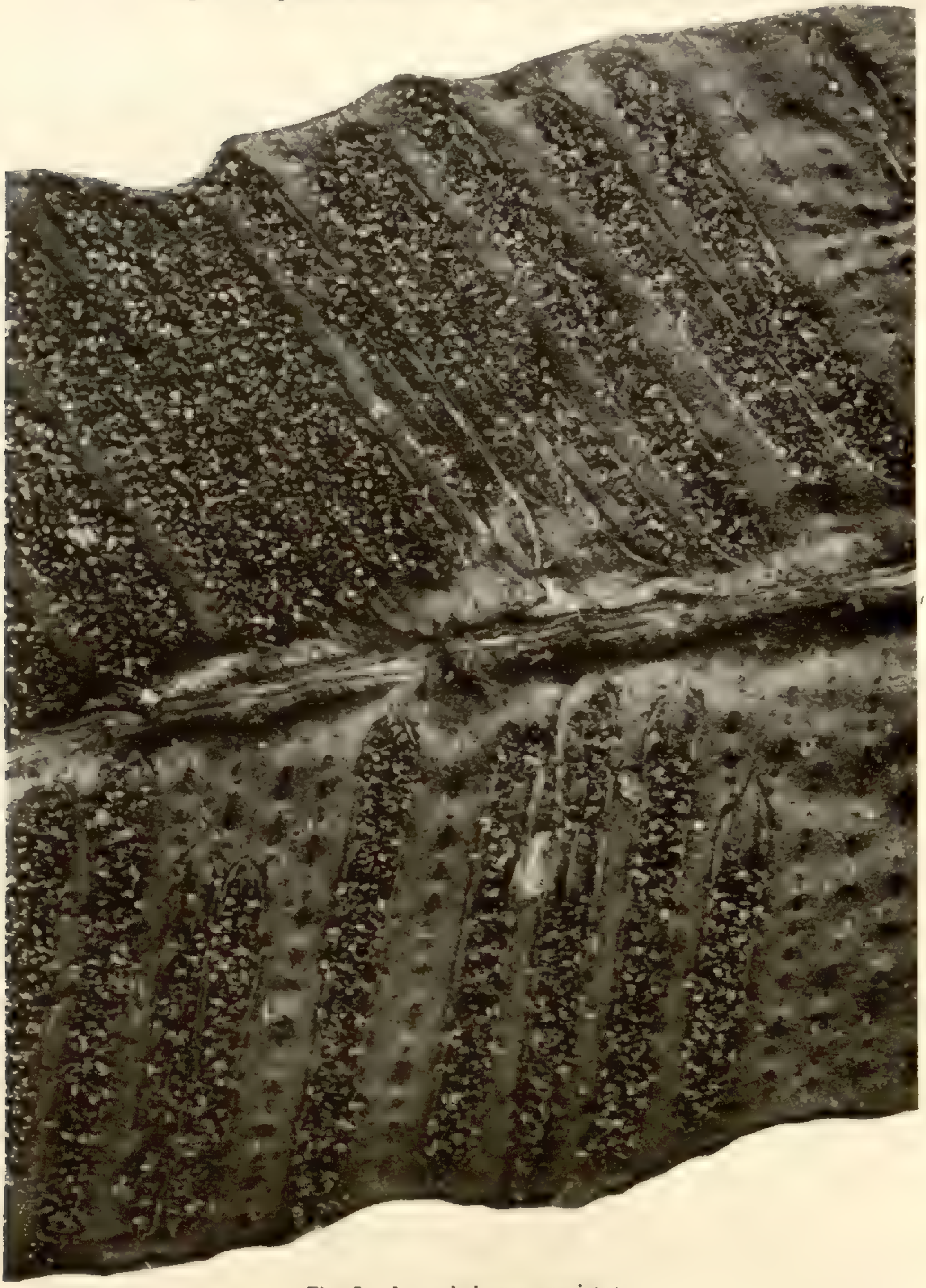

Fig. 2. A much larger specimen.

PLATE V.

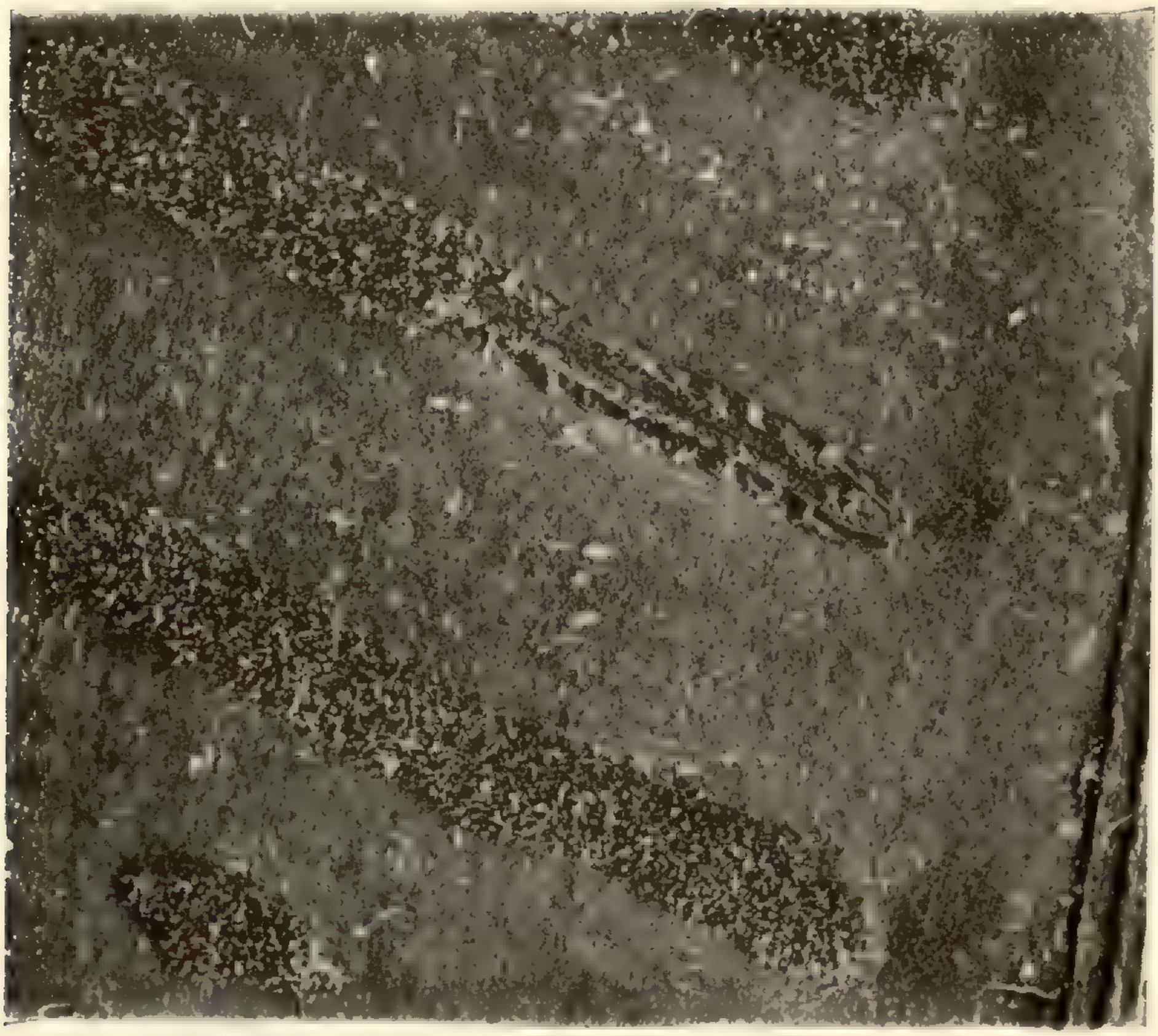

Fig. 3. *Phyllitis Scolopendrium* Newm.

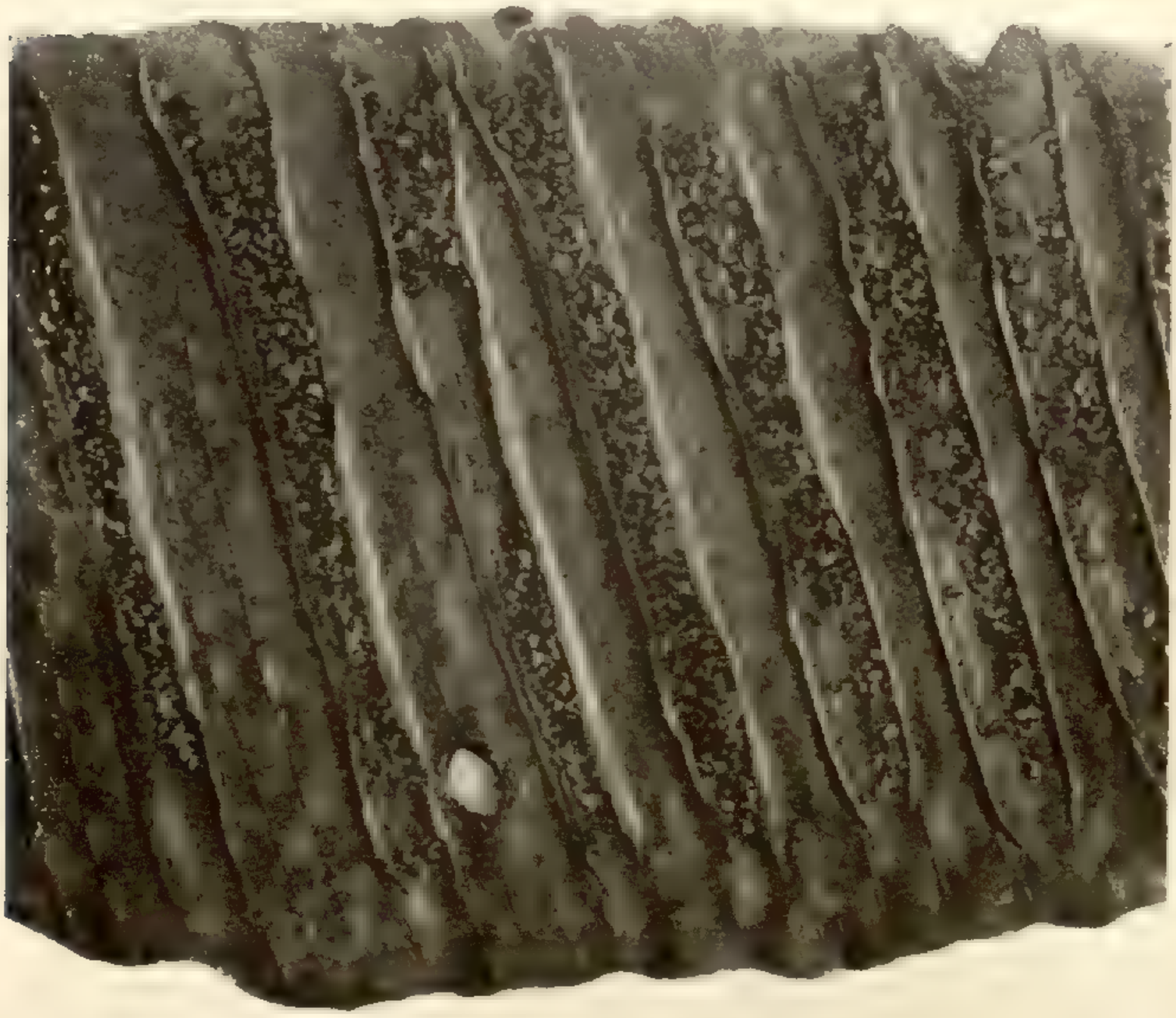

Fig. 4. *Triphlebia Linza* Baker.

PLATE VI.

Fig. 5. *Phyllitis intermedia* v. A. v. R.

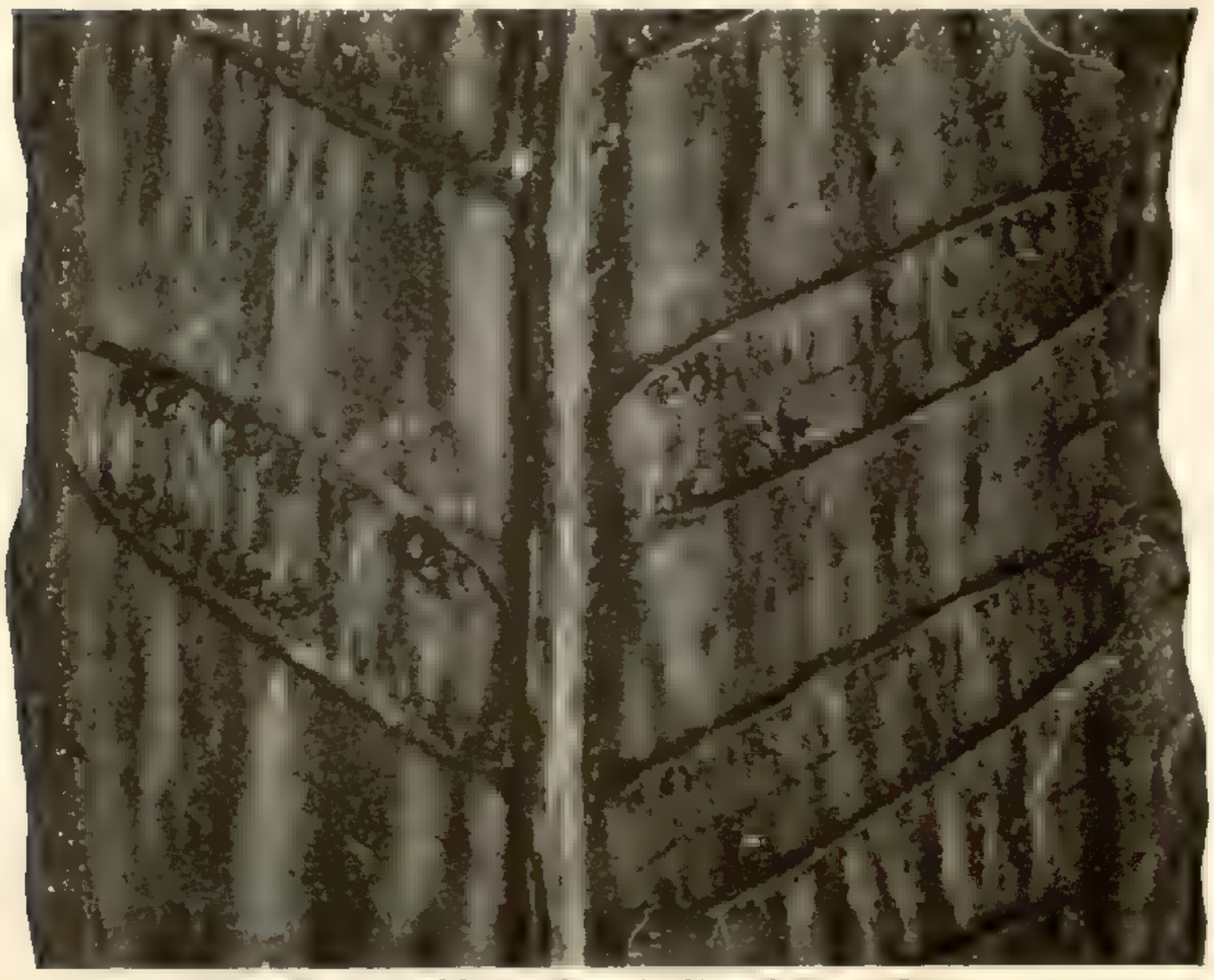

Fig. 6. *Triphlebia longifolia* of New Guinea.

Fig. 7. *Asplenium epiphyticum* Copel.

PLATE VII.

THE PHILIPPINE JOURNAL OF SCIENCE, C. BOTANY
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THREE NEW SPECIES OF MENISPERMACEAE

By L. DIELS

(*Marburg, Germany*)

PARABAENA Miers

PARABAENA ECHINOCARPA Diels sp. nov.

Rami glabri striati. Foliorum petiolus 10–15 cm longus basi geniculato-curvatus; lamina membranacea, glaberrima, cordata, integra, apice acuminata, 8–25 cm longa, 11–12 cm lata; nervi basales circ. 7-palmati, subtus cum lateralibus 1–2 utrinque abeuntibus secundariisque subtus prominentes. Inflorescentiae ♂ e ramis foliatis ortae, pedunculatae, paniculatae, 9–12 cm longae; rami primarii patentes iterum ramulosi, ramuli bracteati bracteis pedicelli dimidium subaequantibus, pedicelli bracteaeque minute pilosuli. Sepala uninervia, ca. 2.5 mm longa, 3 exteriora a basi angustata 1.8–2 mm lata, 3 interiora 1.3–1.5 mm lata; petala 6 obtriangulari-obovata vix 1 mm longa. Synandrium breviter stipitatum 0.7 mm diamet., apice (stylorum rudimento) appendiculatum. Drupae (siccae) 8–9 mm longae; endocarpium extus densissime echinatum, condylus faciei ventralis partem medianam occupans subconvexus, dentibus spiniformibus meatum obvallantibus.

CAMIGUIN DE MINDANAO, ♂ flor. et fruct. m. Mart. et Aprili, 1912, *Bur. Sci. 14722 Ramos.*

This new species is recognized by the leaves being totally glabrous, entire, cordate, and the endocarp being even more bristly than in *Parabaena philippinensis.*

TINOMISCIUM Miers

TINOMISCIUM MOLLE Diels sp. nov.

Rami (sicci) sulcati pubescentes. Foliorum petiolus 12–15 cm longus, et basi et apice geniculato-curvatus; lamina firme chartacea, supra glabra laevis, subtus dense pubescens mollis, e basi truncata vel emarginata subtriangulari-ovata, apice acute acuminata, ca. 20 cm longa, 12 cm lata, nervi primarii basales 5 validi subtus cum secundariis prominentes, praeterea laterales 2–3 utrinque a costa anteriore abeuntes eodem modo subtus prominentes. Inflorescentiae ♂ ca. 20 cm longae, rhachis pedicellique rufo-puberuli; bracteae angustissimae 1–1.5 mm longae;

pedicelli stricti 5–6 mm longi; sepala 3 exteriora ca. 1 mm longa, 6 interiora elliptica trinervia cymbiformia subglabra demum stellato-expansa, 5.5–6 mm longa, 2–2.5 mm lata, 6 interiora a marginibus involuta, glabra, 3 mm longa; stamina 6 lata petaloidea, 2.5–2.7 mm longa, 1 mm lata.

LUZON, Prov. Nueva Vizcaya, Dupax, fioribus ♂ in m. Mart. Aprili, 1912, *Bur. Sci. 11359 McGregor.*

Species nova a *T. philippinensi* Diels proxime affini foliis angustioribus basi emarginatis subtus densius pubescentibus mollibusque distinguitur.

TINOSPORA Miers

TINOSPORA HOMOSEPALA Diels sp. nov.

Scandens, rami glabri lenticellis pallidis praediti. Foliorum petiolus 4 ad 6 cm longus, lamina papyracea glabra, e basi emarginata vel cordata late ovata vel cordato-ovata, apice acuminata, 10 ad 12 cm longa, 9 ad 10 cm lata, nervi primarii 5-palmati subtus pallidiores, secundarii nervulique reticulati. Inflorescentia ♂ anguste racemosa, bracteae pedicello 3 ad 5 mm longo breviores. Sepala 6, subaequalia, concava, subelliptica, 3 exteriora 3–5-nervia, 4.5 mm longa, 2.5 ad 3 mm lata, 3 interiora sublatiora, plurinervia, 4 ad 4.5 mm longa, circiter 2.5 mm lata. Petala 6, obovato-subrhombea margine anteriore inflexa, circiter 2.5 mm longa. Stamina 3 ad 3.5 mm longa, filamentum apice subdilatatum, antherae longitudinales subobliquae. (Flores ♀ atque fructus adhuc ignoti.)

INSULAE MARIANNAE, Guam, ad viarum margines in fruticetis, flor. Oct. 1911, *R. C. McGregor 536.*

Species nova *T. reticulatae* philippinensi non dissimilis sepalis subaequalibus (exterioribus non brevioribus) ab illa et plerisque speciebus generis facile distinguitur.

THE PHILIPPINE JOURNAL OF SCIENCE, C. BOTANY
Vol. VIII, No. 3, May, 1913.

ON ERAGROSTIS CILIANENSIS (ALL.) VIGNOLO LUTATI

By F. TRACY HUBBARD

(*Cambridge, Mass., U. S. A.*)

The widely distributed grass, commonly known as *Eragrostis major* Host and as *E. megastachya* Link, presents a complicated case of synonymy, and a detailed study of the questions involved shows that neither of the above names is valid in accordance with the provisions of the International Code of Botanical Nomenclature. Herewith is given a partial list of synonyms, followed by a discussion of the questions involved.

ERAGROSTIS CILIANENSIS (All.) Vignolo Lutati in Malpighia 18 (1904) 386.

Briza eragrostis L. Sp. Pl. (1753) 70.
Poa multiflora Forsk. Fl. Aegypt.-Arab. (1775) 21.
Poa cilianensis All. Fl. Pedem. 2 (1785) 246, *t. 91, f. 2.*
Poa eragrostis Cav. Ic. 1 (1791) 63, *t. 92.*
Briza oblonga Moench Meth. (1794) 185.
Poa megastachya Koel. Gram. (1802) 181.
Eragrostis major Host Gram. Austr. 4 (1809) 14, *t. 24.*
Eragrostis megastachya Link Hort. Berol. 1 (1827) 187.

Taking the synonymy in order of date the oldest name is *Briza eragrostis* L., which is invalid because of *Poa eragrostis* L. Sp. Pl. (1753) 68, which is the name-bringing synonym of *Eragrostis* (L.) Beauv. Agrost. (1812) 71 & text accompanying *t. 14, fig. 11*, the species commonly heretofore known as *E. minor* Host Gram. Austr. 4 (1809) 15.

Poa multiflora Forsk., the next synonym, is invalid because there is already *Eragrostis multiflora* (Roxb.) Trin. in Mém. Acad. St. Petersb. VI 1 (1830) 401, which is the oldest name of a valid species.

Poa cilianensis All. is the oldest valid name of the species known as *Eragrostis major* Host or *E. megastachya* (Koel.) Link. There seems to be no doubt as to the identity of the plant which Allioni describes. It was collected by Bellardi on his father's estate of Ciliani in Piedmont and is a low-ground form of *E. major* Host, if we can believe subsequent authors. The description is adequate and fair, the plate worthless. The definite status of the species, however, has definitely been settled by

Doctor F. Vignolo Lutati [1] who has examined specimens of *Poa cilianensis* All. in the herbaria of Bellardi, Balbis, and Biroli, all of them from the type locality and presumably received from Allioni, whose herbarium, at his death, became the property of Balbis. In summing up he says in heavy type "*La Cilianensis All. non è altro che una Eragrostis megastachya Lk. in uno speciale stadio di sviluppo.*" He makes the combination *Eragrostis cilianensis* (All.) Lk., but the citation of Link as an authority seems to be inaccurate as I cannot find that Link ever made or hinted at such a combination. Consequently I believe that the correct authority of the combination *Eragrostis cilianensis* to be Vignolo Lutati and not Link. The name *Eragrostis cilianensis* does not occur in Index Kewensis or in any of its supplements published to date.

Roemer & Schultes Syst. Veg. 2 (1817) 556 give *Poa cilianensis* with a good description, but Schultes in the Mantissa 2 (1824) 308 under *P. cilianensis* gives the following: "Esse eandem cum *Megastachya Eragrosti*, et delendam, Bertoloni in litt." *Megastachya Eragrostis* (L.) R. & S. Syst. Veg. 2 (1817) 584 (Beauvois did not make the combination) is a synonym of *Eragrostis major* Host.

Poa cilianensis has been given as a synonym of *Eragrostis major* Host or some of its numerous synonyms by the following authors: Schultes Mant. 2 (1824) 325; Kunth Rev. Gram. 1 (1829) 133; Kunth Enum. Pl. 1 (1833) 333; Parl. Fl. Ital. 1 (1848) 380; Richer Pl. Eur. 1 (1890) 73; MacMillan Metasp. Minn. Valley (1892) 75; Hook. f. Fl. Brit. Ind. 7 (1896) 320.

Ascherson & Graebner (Syn. Mitteleur. Fl. 2 (1900) 371) under *E. megastachya* (Koel.) Link discuss the question of the specific name and make a variety, *E. megastachya* var. *β cilianensis*, giving *Poa cilianensis* All. as the first synonym of it. Their discussion leads to several rather startling deviations from the point of view of the present code rules.

Translating in brief some of the principal points of their discussion we find that they accept the name *E. megastachya* (Koel.) Link because *E. eragrostis* is applicable at will to either *major* or *minor* and is used by them for what may be termed the holding species. They refuse to take up *multiflora* because Ascherson & Schweinfurth renounce it for similar reasons (i. e., it probably is a complex species). *Poa cilianensis* is not the typical plant and is a questionable form in its systematic value; consequently

[1] Sul valore sistematico della *Poa Cilianensis* All. (1785). Malpighia 18 (1904) 380–387.

they cannot make up their minds to use the name *cilianensis*. They dispose of *oblonga* (*Briza oblonga* Moench) because, on account of the insufficient description and the loss of Moench's herbarium, the identity of the same cannot definitely be settled. This does not seem to me to be true, as Moench cites two things which with his scanty, though applicable (as far as it goes) description, would fix the name to what has been known as *Eragrostis major* Host. These two things are his synonymy: *Briza eragrostis* L. and the citation of Morison's Plant. Hist. which is unquestionably *E. major* Host.

While Ascherson and Graebner's deductions may be good reasoning they certainly are not according to any code and certainly do not dispose of either *cilianensis* or *oblonga* as older names than *major* or *megastachya*. Even supposing that Poa *cilianensis* All. were varietally distinct the name would still have to be retained for the species, making the more common form a variety, but judging from Ascherson and Graebner's remarks I should consider it a depauperate, damp-ground form of the species and not a true variety. Their last remarks under the variety they have just created are that this noticeable form can, however, scarcely be considered a variety, since it occurs together with the typical form on one plant. The status of *Poa cilianensis* All. has, however, definitely been settled by Vignolo Lutati, cited above, and there is no doubt whatever but that *Eragrostis cilianensis* (All.) Vignolo Lutati is the oldest valid specific name for the common and very widely distributed grass commonly known as *Eragrostis major* Host, and as *E. megastachya* Link.

THE PHILIPPINE JOURNAL OF SCIENCE, C. BOTANY
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CYRTANDRACEAE NOVAE PHILIPPINENSES, I

By F. KRÄNZLIN

(*Berlin, Germany*)

The collections of Cyrtandraceous plants, made for the Bureau of Science, for several years past have been communicated from time to time to the Kgl. Botanisches Museum at Berlin, and the entire collection has been submitted to me for determination.

The number of new species of *Cyrtandra* is remarkable. All botanists who have worked on this interesting and difficult family are aware of the fact that the geographic range of the great majority of the species is very limited, and that even in the same range of mountains each valley may have its own peculiar forms or even species. The great number of species, their origin, and their restricted ranges are puzzling facts and the rapidly increasing number of known species in the genus is, in respect to classification, somewhat disagreeable and troublesome. Will *Cyrtandra* become a great genus like *Ficus* or *Dendrobium?* In 1883, C. B. Clarke admitted 167 species, and if we cannot double this number to-day we are certainly not far from it. As in *Ficus* and *Dendrobium,* so in *Cyrtandra,* those species distinguishable only by slight characters greatly predominate over those that are sharply defined. With the recent discovery of so many species in the more accessible parts of the Malayan region, what a boundless number of species we may expect from the future botanical exploration of the interior of Borneo and of New Guinea! For the present the "Conspectus generum" as established by the late C. B. Clarke can and should be maintained, and it is to be hoped that it will prove to be serviceable for a much longer time in the future. The comparatively large number of species proposed in this paper were rather easily arranged and distributed according to the outline of classification constructed by Mr. Clarke.

AESCHYNANTHUS Jack

AESCHYNANTHUS FOXWORTHYI Kränzl. sp. nov. (§ *Haplotrichium*).

Caulis 75 ad 100 cm longus, pars, quae adest, 46 cm longa, cortice glaberrimo, brunneo, nidito tecta, internodia 5 ad 7 cm plerumque

6 cm longa, nodis leviter incrassatis. Folia satis longe (1.5 ad 2 cm) petiolata, ovata vel ovato-oblonga, brevi-acutata, lamina omnino glabra, saepius leviter asymmetrica, ad 8 cm longa, 4 cm lata. Racemi brevissime pedunculati, quam folia breviores, 3- vel (rarius) 4-flori (flore quarto abortivo), pedicelli perbreves, 5 mm longi, compressiusculi vel alati (!) incrassati. Calycis ad ipsam basin fissi segmenta anguste lanceolata, 4.5 ad 5 mm longa, vix 1 mm lata, sparsissime pilosa. Corolla vix ut plurimum in dorso paulum curvata, si mavis infra medium paulum contracta, labii superioris segmenta fere orbicularia, rotundata, labii inferioris segmenta lateralia multo majora, intermedium etiam majus, leviter complicatum, tota corolla extus sparse pilosa, excl. orificio patente 3 cm longa, purpurea. Stamina corollam aequantia, filamenta in tubo corollae convoluta, vix expansa tubum bene excedentia. Stylus crassiusculus, superne attenuatus, stigma globosum, antice profunde excavatum; discus hypogynus obtuse pentagonus, quinquesulcatus. Capsula mihi non visa. Floret Martio.

LUZON, Prov. Tayabas, Quinatacutan, *Bur. Sci. 13200 Foxworthy & Ramos.*

This species differs from *Aeschynanthus philippinensis* C. B. Clarke in its longer leaves, which, including the petioles, are mostly 10 cm in length. The flowers also are a little larger than are those of Clarke's species; the calyx is cleft to the base; the pubescence of the flower is more scanty; and the pedicels are compressed and two-edged.

AESCHYNANTHUS CAMIGUINENSIS Kränzl. sp. nov. (§ *Holocalyx*).

Caulis certe longus, pars quae adest circ. 60 cm longa, glaberrimus, in nodis passim radicans, radicibus crassiusculis fasciculatis, internodia 4.5 ad 5.5 cm longa. Folia crebra petiolata, oblongo- vel ovato-lanceolata, crassa, carnosa, glaberrima, petioli crassi, in nervum medianum crassum producti, 1 cm longi; laminae ad 6 cm longae, 1.5 ad 1.8 cm latae, apice obtusae. Flores singuli vel bini, pedunculi subnulli, pedicelli 1 ad 1.2 cm longi, longe pilosi ut etiam calyces. Calyx brevi-campanulatus, in dentes 5 perbreves, triangulos divisus, 5 mm longus, dentibus vix 1 mm. Corolla e basi angusta sensim ampliata, recta, extus dense glanduloso-pilosa, orificio connivente subclauso, lobis 2 labii superioris brevibus rotundatis, margine fimbriatis; labio inferiore a superiore satis sejuncto, lobis antice retusis, fimbriatis, tota corolla 1.8 cm longa, antice 4 mm diametro, sicca sordide purpurea. Fl. Martio, Aprili.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14491 Ramos.*

From the one flower examined there are no particularly characteristic features to be observed in the interior of the corolla. It is one of the

numerous species in the series of slightly differentiated forms allied to *Aeschynanthus volubilis* Jack. *A. Hoseana* Kränzl. is perhaps the most closely allied species, at least as to its general appearance.

AESCHYNANTHUS LOHERI Kränzl. sp. nov. (§ *Holocalyx*).

Caulis pars, quae adest, 20 cm tantum longa, radicibus perpaucis obsita, omnino glabra, internodia 1.5 cm ad 1.8 cm longa. Folia brevi-petiolata, ut plurimum 3 mm petiolis brevissime pilosis, laminae latissime oblongae, suborbiculares aut fere orbiculares, brevi-acutatae vel obtusae vel imo rotundatae, 2 ad 3 cm longae, 2 ad 2.8 cm latae, superne et subtus glaberrimae, crassiusculae, inflorescentiae biflorae, pedunculus brevis, vix 1 cm longus, bracteis 2 fere in cupulam connatis magnis latis obsitus, pedicelli 1.3 cm longi, brevissime pilosi, superne dilatati. Calyx amplus urceolaris, supra vix ampliatus, brevi-dentatus, dentibus brevi-triangulis, glaberrimus, 2.5 cm longus, basi 1 cm, in orificio 1.3 cm diam. Corolla levissime curvata, ampla, 5 cm longa, minutissime pilosa et margine loborum ciliata, labium superius parvum, lobis 2 parvis rotundatis, labium inferius a superiore vix sejunctum, lobi laterales magni late oblongi, rotundati, lobus intermedius deflexus, antice retusus. Stamina corollam aequantia vel (longiora 2) illam excedentia. Discus hypogynus brevis integer, stylus curvulus minute pilosus. Fl. Januario.

LUZON, Prov. Rizal, Montalban, *Loher 6663*.

Aeschynanthus Curtisii C. B. Clarke, of northern Borneo, is the only species to which *A. Loheri* can be compared, but in the former the flowers are much the larger, the calyx being 4.2 cm long and only 1 cm shorter than the corolla, while in the latter the corolla is twice the length of the calyx.

AESCHYNANTHUS LEUCOTHAMNOS Kränzl. sp. nov. (§ *Haplotrichium*).

Caulis tenuis certe pendulus, radicibus multis tenuibus obsitus, albidus (unde nomen!), nitidus, cortice fragili passim sparsissime piloso vestitus, internodia 3 cm longa, pars quae adest 50 cm longa, ubique eadem crassitie. Folia pro planta parva, brevi-petiolata, ovata, obtusa vel obtuse acutata, glabra, sicca livida (fere ut caulis), maxima 3 cm longa, 2 cm lata, apicem versus multo minora. Racemi 5- vel 6-flori, pedunculo brevi, floribus conglomeratis. Calyx rectus, urceolaris, glaber, margine tantum ciliatus, aeque 5-lobus, lobis late obtuseque triangulis, ad 4 cm longus, in orificio 1.8 cm diametro. Corolla paulum supra basim constricta, quam calyx multo angustior, levissime curvata, supra dilatata, labium superius rectum, profunde bilobum, lobis rotundatis, labium inferius a superiore sinu amplo divisum, lobis

parvis rotundatis reflexis, tota corolla sparsim pilosa, 5 cm longa, in orificio patens, 2 cm diam. Filamenta parcissime pilosa, corollam paulum superantia, antherae per paria conglutinatae. Stylus compressiusculus pilosus, staminibus brevior, stigma magnum; de colore nil relatum est, corolla purpurea fuisse videtur. Fl. Octobri.

MINDANAO, Prov. Misamis, *For. Bur. 19518 Klemme.*

In general appearance this species much resembles *Aeschynanthus radicans* Jack, but it is entirely glabrous, the dimensions are very different, and the flowers are arranged in dense clusters. It is also very near *A. Lobbianus* Hook. f., but this species has very pubescent leaves and calyx, and in leaf-form is also quite different.

AESCHYNANTHUS SERPENS Kränzl. sp. nov. (§ *Holocalyx*).

Caulis volubilis longe inter muscos repens, exceptis insertionibus petiolorum glaber, griseus, radicibus longis, tenuissimis obsitus, internodia ± 3 cm longa. Folia brevi-petiolata, elliptica, obtusa, crassiuscula, margine revoluto, glaberrima, petioli crassi in nervum medianum producti, minute setosi, 4 mm longi, laminae 2.5 ad 4.5 cm longae, 1.5 ad 1.8 cm latae. Flores bini, brevipedicellati. Calyx cylindraceus, superne retusus, dentibus 5 brevissimis praeditus, 6 mm longus, 4 mm diam., certe (purpureo- ?) coloratus, pilis albidis pluriarticulatis, glandulosis vestitus. Corolla cylindracea, dorso leviter curvata, lobi labii superioris vix vel parum divisi, laterales labii inferioris late ovatotrianguli, intermedius deflexus oblongus, omnes obtusi, tota corolla 3 cm longa, quo amplissima circ. 6 mm diam., sordide purpurea, extus satis dense pilosa. Stamina mihi non visa ab insectis destructa. Stylus brevissimus, calycem vix excedens. Fl. Novembri.

MINDANAO, Distr. Zamboanga, Sax River, *Merrill 8260,* creeping over boulders on forested slopes, altitude about 100 m.

The only species with which this can be compared is *Aeschynanthus Beccarii* C. B. Clarke, but in that species the corolla exceeds the calyx only by one-half its length, while in *A. serpens* it is more than four times as long. The only flower available for examination was injured by insects, the stamens having been destroyed, but the corolla and style were intact.

AESCHYNANTHUS STENOCALYX Kränzl. sp. nov. (§ *Polytrichium* ?)

Caulis pars, quae adest, strictissima, ad 50 cm longa, omnino glabra, cortice griseo-albo, sicco ruguloso tecta, internodia 3 ad 6 cm longa. Folia brevi-petiolata, lanceolata, basi et apice angustata, glaberrima, cum petiolo 5 mm longo, ut plurimum 6 cm longa, medio 1 ad 1.3 cm lata. Racemi biflori (semper ?), basi bracteolis quibusdam inanibus vestiti, pedunculus subnullus, pedicelli tenues, subcompressi, 1 cm longi. Calyx basi vix con-

natus statim in segmenta 5 basi lanceolata, deinde linearia divisus, segmenta 2.5 cm longa, vix 1 mm lata. Corolla tubulosa, lobis 5 vix inter se diversis, rotundatis, margine fimbriatis, 2.5 cm longa, in orificio 6–7 mm diam. Staminum filamenta corollam excedentia, valde torta, compressiuscula, omnino pilosa, 3 cm longa, adest in media corolla rudimentum minutum staminis quinti. Stylus glanduloso-pilosus, corollam aequans vel subexcedens, ovarium lanceolatum compressum, annulus satis magnus, leviter 5-partitus. De colore nil constat. Fructus mihi non visi. Fl. Decembri.

LUZON, Prov. Tayabas, *For. Bur. 13087 Curran.*

At first glance this species might be taken for *Aeschynanthus Fraseriana* Kränzlin, or a small specimen of *Aeschynanthus Motleyi* C. B. Clarke, although the latter is always a larger species. It differs from the first in its longer pedicels but principally by its flowers not being dimorphous. While in *A. Fraseriana* two kinds of flowers are found, macrostyle and brachystyle, we find in this species that all the flowers have the stamens and styles of normal length and dimensions, as in the greater number of species in the genus. The five characteristic cushions of hairs found in *A. Fraseriana,* always well developed and alternating with the filaments and staminode in the interior of the corolla, are wanting in *A. stenocalyx* Kränzl.

DIDYMOCARPUS Wallich

DIDYMOCARPUS PALLIDA Kränzl. sp. nov. (§ *Kompsoboea*).

Caulis brevissimus, circ. 1 cm longus. Folia congesta ad 6, e basi cuneata oblonga obtusa, subfalcata vel subobliqua, margine crenato-dentata, superne glauca, glabra, subtus pulchre reticulato-nervosa et secus nervos glanduloso-pilosa, pilis glutinosis saepe particulis soli sordidis, magnitudine omnia diversa, minimum 2.5 cm longum, 1.5 cm latum, maximum 13.5 cm longum, 3.5 cm latum. Flores brevissime pedunculati. Calycis in tertia inferiore integri lobi, basi trianguli in apicem longum linearem angustati, extus pilis longis articulatis obsiti, totus calyx 1.2 cm longus. Corolla (mihi in alabastro tantum nota) extus pilis sericeis longissimis obsita, intus glabra. Stamina brevia, antherae magnae. Stylus omnino glaber, ovarium fusiforme, annulus brevis, tamen manifestus. Fl. Novembri.

MINDANAO, Distr. Zamboanga, Sax River, *Merrill 8224,* in damp ravines, altitude 800 m.

Among the species figured, *Didymocarpus gracilipes* C. B. Clarke gives the best idea of *D. pallida.* The specimen was young, but fortunately there were well developed buds, from which my diagnosis was taken. Capsules were wanting and so I am unable to determine whether or not the flower-stalks increase in length after fertilization as is the case in Clarke's species. The pubescence of the corolla is more copious than in any other species of the genus known to me.

RHYNCHOGLOSSUM Blume

RHYNCHOGLOSSUM MERRILLIAE Kränzl. sp. nov.

Plantula vix 5 cm alta. Caulis perbrevis, foliis 2 vel 3 obsitus, subcompressus, inter muscos absconditus. Folia petiolata more generis valde asymmetrica, ovato-cordata, acuta, sicca atrata, viva certe viridia, glaberrima; singula vel in infimis addito foliolo oblique opposito multo minore, maxima 4 cm longa, basi 2 cm lata. Racemus secundiflorus, pauciflorus (3 vel 4), bracteae nullae. Calycis basin usque fissi segmenta ovata, acuminata, dorso non carinata, 5 mm longa. Corolla parum brevior quam tota planta, deflexa, labium superius parvum, bilobum, lobulis erectis, vix dimidium totius corollae aequans, labium inferius multo majus antice obscure trilobum, lobis rotundatis. Stamina 2, filamenta brevia, convergentia, antherae contiguae, inter se connatae (si tantum aliquantula dejungendae). Tota corolla ad 3 cm longa, labium superius circ. 1.3 cm longum, labium inferius antice ultra 1.5 cm latum. Flores intense coerulei. Fl. Novembri.

MINDANAO, Distr. Zamboanga, Sax River, *Merrill 8187*, on rocks in damp shaded ravines, altitude about 1,000 m, flowers deep-blue.

A delicate little plant resembling a miniature *Gloxinia*. At first sight I supposed I had to deal with a representative of the genus *Chirita*, a genus not known from the Philippines, but examination proved that I had a *Rhynchoglossum* before me. The lower lip of the extremely tender flower was somewhat injured in drying, and perhaps with more ample material its characters may need some rectification, but on the whole the diagnosis will be found to be correct.

MONOPHYLLAEA R. Brown

MONOPHYLLAEA MERRILLIANA Kränzl. sp. nov.

Radices copiosae tenues. Caulis 6 ad 8 cm altus, crassiusculus, glaber vel sparsissime pilosus. Folium unicum sessile, basi subamplexicaule, e basi retusa vel subcordata ovatum vel ovato-oblongum, apice ?, margine integrum, superne sparsim setosum, subtus ubique et praesertim basin versus dense pilosum, vel imo villosum, ad 20 cm longum, 8 ad 10 cm basi latum. Racemi fasciculati (in uno specimine 7), subaequilongi, ad 8 cm longi, per duas tertias floriferi, floribus in cincinnos paucifloros (ut plurimum 10-floros) dispositis, pedunculi et praesertim pedicelli necnon calyces dense setoso-villosi. Calyces brevi-campanulati, circ. medium usque fissi, dentibus triangulis, 4 mm longi. Corollae mihi non visae. Fl. Novembri.

MINDANAO, Distr. Zamboanga, Sax River Mountains, *Merrill 8110*, on very damp cliffs in deep shaded ravines, altitude about 800 m.

This species is very closely allied to *Monophyllaea hirtella* Miq., and it is not without doubt that I propose it. Miquel's species is known to me only by his very poor description which was repeated by C. B. Clarke in his monograph. The discrepancies, however, between Miquel's description and our species seem to warrant the establishment of the present one, the differential characters being especially in the inflorescence. Miquel says "pedunculis pluribus *longiusculis, apice brevissime ramulosis* ramulis subunilateralibus densifloris," none of these characters agreeing with those of *M. Merrilliana*. In both species the corollas are unknown. The leaves of Merrill's specimen are partly destroyed by moisture, but even when reconstructed to their full size we have a length of only 20 cm and not a "folium pede longius." I take this occasion to recall to botanists living in the Philippines a remark by the late C. B. Clarke who says in his generic diagnosis of *Monophyllaea* "Herbae folio unico *cotyledonae* ?." There is indeed a strange analogy in the whole growth between *Monophyllaea* and the typical *Streptocarpus*.

MONOPHYLLAEA LONGIPES Kränzl. sp. nov.

Caulis 12 ad 34 cm altus, glaber, interdum protuberantiis corticis verrucosus. Folium sessile, cordatum, paulum inaequilaterale, maximum, quod vidi, ad 30 cm longum, 20 cm latum vel ultra (partim ab insectis destructum fuit) basin versus subdense pilosum, apicem et circumferentiam versus glabrescens, subtus omnino glabrum. Pedicelli 2 ad 7, setoso-pilosi, vidi 2 haud plane evolutos ad 20 cm longos, floribus secundis, brevi-pedicellatis plerumque 2, ebracteatis, 2–3 cm longis. Flores glabri, 3 mm longi, 2 mm diametro; pedicelli ancipites bialati. Calycis basin usque fissi segmenta oblonga vel elliptica, 3.5 mm longa, maxima 2 mm, minima 1.5 mm lata, omnia apice obtusa. Flores coerulei esse dicuntur, corollae mihi non visae. Fl. Januario.

LUZON, Prov. Cagayan, *For. Bur. 13869, 19600 Curran*, on rocks in damp forests.

I first was of the opinion that I had to deal with *Monophyllaea hirtella* Miq., but Miquel states that the inflorescence of his species has a "cymose" ramification, while in all species of the genus known to me they are scorpioid. In general the plant recalls somewhat *Monophyllaea Lowii* C. B. Clarke and *M. glauca* C. B. Clarke, but the principal characters of the present species agree with neither. A peculiar feature, and one not previously recorded for the genus, is that the pedicels are ancipitous or two-edged and that two of the five calyx-segments are only one-half as broad as the other three.

DICHROTRICHUM Reinwardt

DICHROTRICHUM CRASSICAULE Kränzl. sp. nov.

Caulis pars, quae adest, curvata, adscendens, lignosa, grisea, ad 30 cm longa, 1.5 ad 1.8 cm crassa, glaberrima, florifera, ceterum aphylla. Pars quaedam superior ad 15 cm longa, subtetragona, cortice griseo, fragili, sparse setoso tecta, supra pallide

ferrugineo-villosa. Folia subaequalia vel omnino inaequalia, plus minus asymmetrica, petiolata, lanceolata oblongave, margine simpliciter vel partim duplicato-dentata, superne strigosa, subtus dense albido-luteo-villosa, omnia arrecta, petioli 5 ad 7 cm longi, laminae 25 cm longae, 4.5 cm latae. Racemi e parte inferiore (semper ?) aphylla caulis orientes, brevissime pedunculati vel sessiles; prophylla basilaria racemi obovata, obtuse acutata, extus griseo-strigosa, intus scarlatina, 2.5 cm longa, antice 1 cm lata, bracteae florum obsoletae. Flores ad 15 in dichasium plus minus typicum dispositi, pedicelli florum 1.5 ad 2 cm longi, griseo-pilosi ut etiam calyces. Calyx fere basin usque fissus, 7 ad 8 mm longus, segmenta obovata, apice retusa. Corolla in dorso paulum curvata, antice in lobos 5 vix diversos, quorum anticus deflexus, ceteri convergentes divisa, extus dense strigosa, intus annulo pilorum satis longorum, basin versus deflexorum munita, ceterum glabra, 2.2 cm longa, 7 mm in orificio lata. Stamina longe exserta, filamenta 4 paulum supra basin inserta, extra corollam vario modo torta, antherae majorum biloculares, breviorum certe minores, uniloculares (?), staminodium bene evolutum. Annulus ovarii brevis integer, ovarium fusiforme pilosum, stylus brevi-pilosus, stigma maximum bilabiatum. Fructus mihi non visus. Flores virides esse refert collector clariss. Fl. Martio.

LUZON, Prov. Rizal, Matulid, *Loher 6651*.

This species somewhat resembles *Cyrtandra radiciflora* C. B. Clarke and *C. rhizantha* Kränzl., but an examination of the flower shows four well developed stamens, and that the plant has all the characters of *Dichrotrichum*.

DICHOTRICHUM PRAELONGUM Kränzl. sp. nov.

Frutex, 3 ad 4 m altus. Caulis tetragonus, strigoso-villosus. Folia valde inaequalia (folium minus tamen bene evolutum), longe petiolata, lanceolata, acuta vel acuminata, serrato-dentata, superne sparsim pilosa, subtus dense sericeo-pilosa, nervi principales pro magnitudine foliorum 7 ad 10 utrinque, petioli 6 ad 12 cm longi, sulcati, in nervum medianum crassum producti, dense villosi, laminae ad 27 cm longae, 6 cm latae; folium minus ejusdem paris tertia parte circiter minus. Racemi sessiles capitati, inter foliorum paria orientes, pauciflori, densiflori, prophyllis magnis, crassiusculis, extus et intus dense strigoso-pilosis vestiti, prophylla extus rubro-viridia, intus sordide coccinea, obovata, obtusa vel brevi-acutata, 2.5 ad 3 cm longa. Flores in dichasium dispositi, extus densissime villosi. Pedicelli

basi prophyllis 2 post anthesin grandescentibus et involucrum formantibus praediti. Calycis segmenta fere basin usque libera, cuneato-obovata, apice subretusa, obtusangula, 5 ad 6 mm longa, densissime villosa. Corolla 1.5 cm longa, recta, antice aperta, lobi omnes vix diversi, paulum tantum ringentes, anticus deflexus, tota corolla extus densissime villosa, rubro-viridis, intus sparsim pilosa rubra. Stamina corollam duplo excedentia, 3 ad 3.5 cm longa, stylus sub anthesi corollam non excedens. Capsulae 30 cm longae, 2–3 mm crassae, stigmate magno, bilabiato coronatae, dense et molliter pilosae. Fl. Februario.

LUZON, Prov. Laguna, Mount Banajao, *Merrill 7518*, altitude 1,500 m.

In habit very similar to the preceding but the inflorescences are contracted into dense heads and have shorter stalks; they arise in the leaf-bearing part of the plant and not below the leaves. The flowers are smaller and densely covered with hairs, while the fruit-stalks are always longer than the flower-stalks. A singular feature of this shade-growing plant is that all the parts are lengthened in a rather peculiar manner.

SLACKIA Griffith

SLACKIA ? PHILIPPINENSIS Kränzl. sp. nov.

Fruticulus. Caulis certe brevis. Folium (unicum tantum adest) satis longe petiolatum, ovatum, acuminatum, superne hirsutum, subtus cum petiolo lana fulva densissima vestitum, in petiolum in superiore parte late marginatum transiens, petiolus circ. 10 cm longus, 1 cm latus, lamina circ. 30 cm longa, 17 cm lata. Flores pone basin petioli (probabiliter in axilla hujus folii) in glomerulum (ut videtur scorpioideum) aggregati, pedicelli subnulli, calyces extus et intus lana densissima obvelati, basin usque fere partiti, circ. 8 ad 10 mm longi. Corolla mihi non visa. Ovaria dense pilosa, stylus brevis densissime villosus, annulus satis conspicuus 5-lobus. Fructus potius baccae quam capsulae mihi visi. Fl. Novembri.

MINDANAO, Distr. Zamboanga, Sax River Mountains, *Merrill 8295*, in forests, altitude about 900 m.

The only specimen of this plant available for examination, although not in very good condition, showed a striking resemblance to the plate of *Slackia Griffithii* C. B. Clarke. I have not seen a corolla, but in all other characters it agrees with *Slackia*. The pubescence seems to be even thicker than in *S. Griffithii*.

CYRTANDRA Forster

CYRTANDRA HYPOLEUCA Kränzl. sp. nov. (§ *Stellatae*).

Frutex bi- vel trimetralis. Rami crassiusculi, cortice brunneo-griseo, omnino glabro tecti, exceptis partibus supremis no-

vellis; internodia 3 ad 4 cm longa. Folia opposita, plus minus dissimilia et asymmetrica, alterum saepius in rudimentum lineare, mox deciduum reductum, petioli secus insertionem arachnoideo-pilosi, 1.5 ad 2 cm longi, crassiusculi, laminae oblongae, antice longe acuminatae in apicem longiusculum productae, 10 ad 14 cm longae, ad 4 cm latae, superne glaberrimae, pustulatae, subtus omnino pallidae, secus nervos fusco-pilosae, margine integrae vel (juniores) undulatae. Rudimenta foliorum linearia, albo-(arachnoideo-) marginata. Inflorescentiae brevissimae, triflorae (an semper?), bracteae satis magnae, ovatae, longe acuminatae, longe pilosae, ultra 2 cm longae, 5 ad 6 mm latae, omnino liberae. Calycis 1.8 cm longi segmenta basi connata, in apicem linearem, fere teretem producta, extus et praesertim margine pilosa. Corolla urceolaris, supra 5-loba (ab insectis in orificio et intus injuriata), mihi non satis nota, lobis certe non magnis, luteo-alba, ad 2.5 cm longa, extus et intus glabra. Staminodia et pars superior styli mihi non visae; annulus satis altus 5-sulcatus. Fl. Novembri.

MINDANAO, Distr. Zamboanga, Sax River Mountains, *Merrill 8107*, altitude 1,300 m.

Although the flowers have been injured by insects, sufficient characters are evident by which to distinguish the species from others in the "Stellatae" group. It comes nearest to *Cyrtandra hypochrysea* Kränzl., but the lower surface of the leaves is pale-silvery and not golden in color.

CYRTANDRA PALLIDIFOLIA Kränzl. sp. nov. (§ *Brevicaules* sect. nov.).

Caulis 6–7 cm altus, radix copiosa in fibros et fibrillos multos dissoluta, internodia caulis brevia, cortex glaberrimus excepta parte suprema apicali, ubi brevi-pilosus. Folia omnia in apicem caulis congesta circ. 8 vel 9, omnia aequalia vel vix diversa, sessilia, e basi haud multum angustiore dilatata lineari-oblonga vel anguste obovata acuta, crenato-dentata, superne et subtus scabriuscula, superne ceterum glabra, subtus secus nervos fulvo-pilosa, nervis paulum incrassatis, folia maxima ad 18 cm longa, 3 ad 3.5 cm lata, superne pallida, subtus intensius colorata. Flores ex axillis foliorum orientes 5 vel 6 in dichasium breve aggregati, bracteae ovatae, acutae, non coalitae, persistentes, 1.2 cm longae, pedicelli breves. Calyx angustus, lobi lineares dimidium calycis aequantes. Corolla e basi perangusta vix 2 mm diametro, sensim dilatata, typice infundibuliformis, tenera, pellucida, verosimiliter alba, 4 cm longa, in orificio 1.5 cm diametro, glabra. Stamina in dimidio inferiore corollae, antheris conglutinatis. Stylus brevis, stigma late patens. Fl. Martio.

LUZON, Prov. Tayabas, Tagcauayan, *Bur. Sci. 13379 Ramos.*

CYRTANDRA FLORULENTA Kränzl. sp. nov. (§ *Dissimiles*).

Frutex multiramosus. Rami vetustiores grisei, novelli fulvo-tomentosi. Folia inaequalia (minus cujusque paris multo minus tamen bene evolutum), petiolata, oblongo-lanceolata, subito acutata, pauci- et grosse dentata, basin versus cuneata, superne glabra, opaca, subtus pallidiora, secus nervos fulvo-tomentosa, cum petiolo 1 ad 1.5 cm longo 9 ad 11 longa, 2 ad 2.5 cm lata, folia minora circ. 4 ad 5.5 cm longa, 1 ad 1.5 cm lata. Flores satis crebri, fere ex axilla quaque partium vetustiorum orientes, in dichasia triflora dispositi, pedunculi pedicellique breves, ipsi calycesque pilis longis fulvis vestiti, bracteae lineares parvae villosae. Calyx satis profunde fissus, pars basilaris infundibuliformis, segmenta lanceolata, in apicem longum protracta, totus calyx circ. 1.3 ad 1.5 cm longus, infra dimidium fissus. Corolla infundibuliformis, supra in lobos 5 vix diversos partita, extus longe villosa intus glabra, alba, ultra 3 cm longa, in orificio 1.5 ad 1.8 cm diam., lobi obtusissime trianguli, subrotundi. Ovarium et stylus longe pilosi. Fl. Martio, Junio.

LUZON, Subprov. Bontoc, Bauco, *Vanoverbergh 855*.

An attractive little shrub, the profusely produced, large, white flowers in pleasing contrast to the dark-green foliage. If one of my brother botanists should unite this species with *Cyrtanda incisa* and regard it as a mere variety of that species it would not be surprising. On first examining the plant I determined it to be the above species, but a critical examination and comparison of all characters with *C. incisa* shows one discrepancy after another, none of them, however, of great taxonomic value. I finally decided to consider the Bontoc species a distinct one, although, I must confess, founded on rather slight differentiating characters.

CYRTANDRA VERRUCOSISSIMA Kränzl. sp. nov. (§ *Decurrentes*).

Pars caulis, quae adest, 8 cm tantum longa, planta certe altior, pilis multiarticulatis setosis lumine oblique argenti instar nitentibus vestitus, 3 ad 4 mm diam., satis firmus. Folia opposita, aequalia vel vix diversa, lanceolata, minute dentata, basi et apice acuminata, vix petiolata, superne verrucis numerosissimis convexis ornata, subtus eodem numero cavernularum fenestrata, nervi praesertim subtus valde incrassati, numerosi, superficies subtus et superne pilis albidis nitentibus argentata, maxima mihi visa ad 13 cm longa, ad 2 cm lata. Flores ut videtur semper singuli (si mavis dichasium, flore terminali solum evoluto, lateralibus obsoletis), pedunculus 4 cm longus, longe setosus, bracteolae in superiore parte minutae, lanceolatae, pedicellus floris unici brevis. Calyx medium usque fissus, segmenta linearia, 4 mm longa, setosa. Corolla recta, glabra, ad 3.5 cm longa, basi

vix 3 mm diam., pone orificium circ. 7 ad 8 mm lata, alba. De magnitudine et indole loborum in specimine unico destructorum nil pro certo dicere audeo.

BORNEO, Sarawak, without exact locality, *native collector 887*. Collected for the Bureau of Science through the Sarawak Museum.

Very near *Cyrtandra fenestrata* C. B. Clarke but readily distinguishable by its narrower and longer leaves; the pedicels are also longer than in Clarke's remarkable species. Mr. Clarke has taken his specific name from characters of the lower surface of the leaves, while I have taken mine from characters of the upper surface. Clarke's "fenestrae" correspond exactly to my "verrucae."

CYRTANDRA VANOVERBERGHII Kränzl. sp. nov. (§ *Aureae*).

Caulis 2 ad 4 m altus, glaber, apice tantum foliatus. Folia in petiolum brevem crassum angustata, oblonga, acuta, toto margine distanter dentata, dentibus cartilagineo-incrassatis, superne omnino glabra, subtus solummodo secus nervos pilosa, maxima ad 40 cm longa, 14 cm lata, nervi principales utrinque 10 ad 13; folium oppositum multo minus, tamen non in petioli rudimentum reductum. Prophylla racemorum latiora quam longa, margine lobata, brunnea, satis tenera, pedicelli 5 mm longi, bracteae florales non visae. Calycis 8 ad 9 mm longi lobi breves trianguli, subulati, glabriusculi, in apicibus tantum fimbriati. Corolla tubulosa, recta, supra brevi-lobulata, lobis vix inter se diversis rotundatis, extus et excepto orificio intus setoso-pilosa, 1.5 cm longa. Stamina 2 filamentis crassiusculis, glabris, orificium corollae attingentibus, antherae magnae arcte cohaerentes. Stylus bene brevior quam stamina, pilosus, stigma crassum, ovarium elongatum pilosum, annulus pro flore parvo satis evolutus. Flores albi. Fl. Augusto, Septembri.

LUZON, Subprovince of Bontoc, *Vanoverbergh 512*.

A coarse plant, difficult to dry properly. I have made the best description possible from the dried material, and examination of fresh specimens would doubtless indicate additional characteristic features. It shows a close affinity to *Cyrtandra arborescens* Blume and *C. populifolia* Miq. (the latter a very inappropriate specific name).

CYRTANDRA PACHYNEURA Kränzl. sp. nov. (§ *Aureae*).

Frutex 2 ad 3 m altus. Caulis ubi mihi visus, glaber, reticulato-rugosus. Folia singula, nempe altero ad rudimentum minutum reducto, petiolata, late oblonga, acuta basi paulum asymmetrica, margine integra, superne glabra, subtus solummodo secus nervos brunneo-pilosa, maximi mihi visi petiolus 4 cm longus, lamina 22 ad 23 cm longa, 11 cm lata, nervi 10 utrinque, ipsi et nervus medius subtus valde incrassati et prosilientes. Racemi brevi-pedunculati, foliis involucralibus magnis, latissime ovatis,

brevi-acutatis inclusi, dense pauciflori, bracteae florentes tenerrimae, pulchre venosae, oblongae vel subrhombeae, 1 cm longae, 4 mm latae, pedicelli florum brevissimi. Calyx satis amplus, superne 5-dentatus, 7 mm longus, dentibus triangulis, acutis. Corolla calycem paulum excedens, late campanulata, lobis 5 limbi valde patentibus, extus et intus glabra, lobi rotundati, illi labii inferioris majores, tota corolla 1.5 cm longa, 1 cm lata. Stamina brevia crassiuscula, in fundo corollae seclusa, staminodia brevia manifesta. Ovarium ovatum, supra attenuatum, glabrum, 5-sulcatum, annulus magnus, altus, manifeste 5-dentatus, stylus brevis, pilosus, stigma parvum, bilobum. Involucra florum viridialba, corollae pallidae purpureae. Fl. Maio.

LUZON, Subprovince of Benguet, Mount Tonglon, *Merrill 7800*, altitude about 1,800 m.

I am not satisfied with my diagnosis with regard to the characters of the involucre and corolla, as it is difficult to separate the parts in dried material, a remark that applies to the entire § Aureae. The species is allied to *Cyrtandra Antoniana* Elm., and turns black in drying as does that species.

CYRTANDRA LAGUNAE Kränzl. sp. nov. (§ *Decurrentes*).

Fruticosa, 2 m alta. Rami quadranguli, sicci sulcati, omnino glabri. Folia valde inaequalia, alterum semper magnum longe petiolatum, alterum multo minus nunc rite evolutum, nunc in petioli rudimentum reductum. Folia evoluta petiolata, lanceolata, acuminata, basi paulum asymmetrica, in petiolos angustata, a basi medium usque integra, deinde apicem usque remote et minute denticulata, superne opaca glaberrima, subtus pallidiora grisea, scabriuscula, in venis tantum fulvo-pilosa, maxima cum petiolis 5 cm longis ad 30 cm longa, fere 5 cm lata, minora ad 12 cm longa, ad 3 cm lata, pedicelli illorum saepius fulvo-pilosi. Flores in ramulis ultimi ordinis, in dichasia abortu florum lateralium 1-flora dispositi. Calyx in segmenta 5 longe lineari-lanceolata, fulvo-pilosa, corollam fere semiaequantia divisus, fere 2 cm longus. Corolla infundibuliformis vel elongato-obconica, obscure labiata, lobis 3 aequalibus minoribus, 2 majoribus, omnibus semiorbicularibus, tota corolla alba, extus dense longeque pilosa, ad 3 cm longa, superne 1.8 cm diametro. Fl. Februario.

LUZON, Province of Laguna, Mount Banajao, *Merrill 7499*, altitude about 1,800 m.

Very closely allied to *Cyrtandra gracilenta* Kränzl., of northern Borneo, but distinguished by its larger leaves and its single-flowered inflorescences, while in *C. gracilenta* the leaves are rather small and the inflorescences are always 3-flowered. In the Bornean species the leaves are all of the same size or nearly so, while in *C. lagunae* they are very unequal in size.

CYRTANDRA TAGALEURIUM Kränzl. sp. nov. (§ *Macrosepalae*).

Frutex, pars quae adest, 30 cm longa, internodia 4 ad 5 cm longa, pars apicalis tantum fulvo-pilosa. Folia opposita, inaequimagna, minus tamen cujusque paris bene evolutum nec in rudimentum reductum, petiolata, oblonga vel lanceolata, acuminata, basin versus brevi-angustata, margine minute vel vix denticulata, superne glabra, subtus secus nervos tantum rubro-pilosa, margine in dentibus vel interdum etiam pro dentibus penicillis brevibus pilorum praedita, cum petiolo 2 ad 2.5 cm longo 15 ad 18 cm longa, circ. 4 ad 4.5 cm lata, folia minora subobliqua, cum petiolo 1 cm longo 12 cm longa, fere 3 cm lata. Inflorescentiae axillares, pedunculi subnulli, dichasia igitur in fasciculum florum soluta, bracteae minutae lineares liberae, ipsae et pedicelli tenues 1 ad 1.5 cm longi fusco-pilosi. Calyx basi campanulatus, patens, glaberrimus, segmenta triangula, acuta, cum parte basilari 8 mm longa, ubi libera 2.5 mm lata. Corollae tubus brevis mox in lobos 5 patulos, triangulos, acutos solutus, omnino glabra, 1.2 cm longa, in orificio 1.5 cm diam. Stamina 2 filamentis valde flexis, staminodia parum evoluta; ovarium ovatum, glaberrimum, stylus post anthesin elongatus, 6 ad 7 mm longus, stigma usque glanduloso-pilosus, stigma satis crassum, annulus in lobos 5 sat magnos divisus. Bacca in calyce persistens. Flores albi (?). Fl. Martio.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14462 Ramos.*

I can only compare this species with *Cyrtandra lysiosepala* C. B. Clarke, and *C. triflora* Gaudich., the latter of which it greatly resembles in habit and gross characters. Both of the above species, however, have the corollas pubescent externally, while in *C. Tagaleurium* they are entirely glabrous. The name *lysiosepala* was given by A. Gray to a *Cyrtandra* regarded by him as a variety of *C. triflora*, but afterwards raised by Clarke to specific rank.

CYRTANDRA CURRANII Kränzl. sp. nov. (§ *Polynesiae*).

Frutex. Ramuli, qui adsunt, ad 20 cm longi, tortuosi, grisei, in partibus vetustioribus glabri, in apicibus tantum foliati, internodia 5–7 mm longa; partes novellae fusco-ferrugineo-tomentosae. Folia opposita, aequimagna vel vix diversa, petiolata, lanceolata, basi et apice acuminata, superne glaberrima, subtus secus nervos fulvo-pilosa, margine distanter brevi-dentata, ferrugineo-fimbriata, maxima cum petiolo 2 cm longo ad 15 cm longa, medio 2.8 cm lata. Inflorescentiae quam folia bene breviores, dichasiales, axillares, typice triflorae, flore terminali semper evoluto, lateralibus mox obsoletis, mox evolutis, bracteae, pedunculi et pedicelli, et calyces extus fulvo-pilosi, bracteae ovato-

lanceolatae, 6 ad 7 mm longae. Calyx pro flore magnus, amplus, basi cyathiformis, per tres quartas in lacinias triangulas erecto-patulas acuminatas divisus, fere 2.5 cm longus, intus glaber. Corolla infundibuliformis, calycem versus sensim angustatus, supra in lobos 5, quorum 2 multo majores divisa, lobis omnibus rotundatis, sinu amplo inter lobos labii superioris, tota corolla extus excepto limbo longe sericeo-pilosa, 3.5 ad 4 cm longa, in orificio 1.8 cm diametro. Filamenta curvata, glabra, ovarium fusiforme vel ovatum, pilis sericeis dense villosum, stylus pilis glanduligeris stigma usque praeditus, stigma manifeste bilabiatum, annulus sericeo-pilosus, corolla alba vel albida. Fl. Martio.

LUZON, Province of Laguna, San Antonio, *For. Bur. 13189 Curran.*

In the large group Polynesiae of C. B. Clarke there is only one species, *C. compressa* C. B. Clarke from Savai, Samoan Islands, to which *C. Curranii* can be compared, and externally it has several points of resemblance. Clarke's species, however, has a small, nearly glabrous calyx and glabrous ovaries and fruits.

CYRTANDRA RAMOSII Kränzl. sp. nov. (§ *Dispares*).

Frutex ut videtur parvus, specimen, quod praestat, ad 30 cm altum. Caulis glaber vel in partibus novellis apicem versus sensim fulvo-pilosus, internodia varia longitudine, longissima 3 cm longa. Folia opposita, vix diversa, petiolata, oblonga vel oblongo-lanceolata, acuta, margine dimidium usque pauci- deinde apicem versus argute dentata, superne pilis distantibus obsita, subtus praesertim secus nervos rufo-pilosa, margine densius et praesertim in dentibus penicillatim pilosa, maxima 9 ad 12 cm longa, 2 ad 3 cm lata. Flores terni, pedunculus 7 mm longus, bracteae ovatae, acuminatae, 1.3 cm longae, basi 5 mm latae; pedunculi, pedicelli, bracteae, et calyces extus longe fulvo-pilosi. Calyx ample campanulatus, lobi trianguli, longe acuminati, 1 cm longi (totus calyx circ. 1.7 ad 1.8 cm). Corolla e basi angusta tubiformis vel hippocrateriformis, orificio amplissimo, subobliquo, extus densissime pilosa, 3 cm longa, basi circ. 3 mm, in orificio fere 2 cm ampla, lobis 2 majoribus, 3 minoribus. Filamenta glabra, antherae arctissime connatae, staminodia bene evoluta, antheris minutissimis instructa. Stylus dense glanduloso-pilosus, pilis divergentibus, stigma magnum, bilabiatum, ovarium fusiforme, pilis erectis dense vestitum, annulus satis magnus, leviter 5-lobus. Bacca latissime ovata vel ellipsoidea, 1 cm longa, 7 ad 8 mm diam. Flores albi. Fl. Augusto.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 10976 Ramos.*

Although in several respects this species resembles *Cyrtandra tubiflora* Kränzl. and *C. oblongifolia* Benth. & Hook. f., it is rather difficult

to determine its true alliances. In habit it is nearer to the former, a Bornean species, but in floral characters it looks like *Cyrtandra oblongifolia*, a Philippine species.

CYRTANDRA ROSEO-ALBA Kränzl. sp. nov. (§ *Cuneatae*).

Rami quadranguli, setosi, partes novellae apicales dense fulvo-villosae. Folia opposita aequalia vel parum diversa, satis longe petiolata, oblonga vel lanceolata, acuta vel acuminata, superne glaberrima, subtus scaberula, secus nervos fulvo-pilosa, margine integra vel brevissime et valde distanter denticulata, maxima mihi visa cum petiolo 4 cm longo ad 24 cm longa circ. 5 cm lata. Racemi breves, sessiles, pauciflori, fere glomerati dicendi, bracteae parvae, ovatae, obtuse acutatae, pedicelli 3 mm longae. Calyx fere basin usque fissus, ima basi campanulatus, deinde in lobos 5 basi late ovatos, acuminatos, 1 cm longos, basi 5 mm latos divisus. Corolla paulum curvata, e basi ampla contracta, supra dilatata et in lobos 5 vix diversos, parvos, rotundatos divisa, 1.8 cm longa, basi et in orificio 5 mm diam. medio ad 2 mm contracta; corolla et calyx extus necnon pedicelli longe fulvo-pilosi, corolla alba et rosea verosimiliter versicolor. Stamina brevia in dimidio superiore corollae affixa, antherae in ipso orificio. Ovarium ovatum glaberrimum sulcatum, discus vel annulus sat magnus, 5-dentatus. Stylus media longitudine sparsim setosus, stigma pro flore maximum, hians, bilabiatum. Baccae in specimine meo nondum maturae. Fl. Augusto.

LUZON, Province of Laguna, near San Antonio, in forests, *Bur. Sci. 10923 Ramos.*

The most striking character of this species is its wide calyx, which is cup-shaped at the base and incloses the rather small corolla.

CYRTANDRA NERVOSA Kränzl. sp. nov. (§ *Aureae.*)

Frutex 2 ad 3 m altus. Caules subtetragoni, grisei, plerumque minute partibus novellis densius fulvo-pilosi, praesertim in axillis foliorum et juxta insertionem petiolorum. Folia opposita vel non, dissimilia, petiolata, oblonga, brevi-acutata, coriacea, superne glabra, subtus valde nervosa, pallide et sparsissime in lamina, fulvo- secus nervos pilosa, cum petiolis 1.5 ad 2 cm longis 15 ad 18 cm longa, medio 5 cm lata, nervi laterales utrinque 7 vel 8. Inflorescentiae axillares quam folia bene breviores (vix $\frac{1}{3}$ longitudinis aequantes), longe pedunculatae, pedunculi plus minus flexi 3 ad 4 cm longi, fulvo-pilosi, bracteae in involucrum breve 4- vel 5-lobatum coalitae, lobi trianguli, acuti, totum involucrum circ. 7 mm longum, 1 cm diam. Cyma pauciflora, flores (5 vel 6) brevi-pedicellati. Calyx extus fulvo-villosus, pilis apices segmentorum bene excedentibus, segmenta fere basin

usque libera ovata, acuminata, apice linearia, 4 mm longa, pars basilaris calycis 1 mm longa. Corollae tubus calycem vix duplo excedens, supra paulum dilatatus, lobi labii superioris 2 minores semiorbiculares, 3 labii inferioris oblongi, rotundati, tota corolla 1 cm vix longior, extus longe sericeo-pilosa, intus glabra, lobi 3 ad 4.5 mm longi et lati, diaphana, adeo ut stylus et stamina conspicuantur, pallide purpurea. Staminum filamenta hippocrepum formantia, convergentia, ipsa et stylus vix dimidium corollae aequantes. Ovarium ovatum, pilosum, annulus 5-lobatus.

MINDANAO, District of Zamboanga, Sax River Mountains, *Merrill 8126*, in forests, altitude about 800 m.

The plant has the general appearance and habit of species belonging in the sections Dispares and Polynesiae of Clarke, but it is a genuine Aurea. The peduncles are longer than in the majority of the species and the involucre is smaller. The specific name I have selected is not especially appropriate, for many species have prominent veins, but in this case the veins are rather decidedly thickened; moreover the number of species in the genus is now so great that it is getting to be difficult to select entirely appropriate names for the new forms.

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ASCOMYCETES PHILIPPINENSES COLLECTI A CLAR. C. F. BAKER

By H. REHM
(*Munich, Germany*)

(A) PYRENOMYCETES

PERISPORIACEAE

MELIOLA STENOSPORA Winter (Cfr. Gaillard 86, *t. XV, f. a*).

Ad folia *Iteae maesifoliae.*
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 94.*

MELIOLA MICROSPORA Pat. & Gáill. (Cfr. Gaillard 75, *t. XIII*).

Ad folia *Sidae javensis.*
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 117.*

MELIOLA CYLINDROPHORA Rehm sp. nov.

Mycelium inprimis epiphyllum, plagulas orbiculares 3–5 mm lat., demum confluentes, atras, versus ambitum arachnoideas, in centro saepe subcrustaceas formans, ex hyphis repentibus, centrifugis, rectis, longis, 5–7 μ lat., septatis, fuscis, interdum utrinque rectangulariter ramosis contextum. Hyphopodia plurima, subcylindracea, recta, semper opposita, 2-cellularia, cellula inferiore minima, 12 μ alt., 7 μ lat., subfusca, hyphopodia mucronata multo rariora, opposita, 15–18 μ long., 7 μ lat., fusca. Setae ad basim perithecii rarissimae ibique curvatae, erectae, apice acutatae, fusco-nigrae, ca. 200 μ long., ad basim 8–10 μ lat. Perithecia in centro mycelii dispersa, sessilia, globosa, glabra, cellulis verrucose prominentibus, pars haud pertusa, ca. 150 μ. Asci elliptici 2-spori. Sporae oblongae, 4-septatae, utrinque obtusae, ad septa subconstrictae, fuscae, 40 $\times$ 15 μ.

Ad folia *Iteae maesifoliae.*
LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 394.*
Höchst auffällig durch die äusserst reiche Besetzung mit fast cylindrischen, immer gegenständigen Hyphopodien. Dadurch gleicht die Art der *Meliola praetervisa* Gaill., deren Hyphopodien aber zugespizt, deren Sporen viel grösser sind.

MELIOLA QUADRIFURCATA Rehm sp. nov.

Mycelium in maculis epiphyllis brunneolo-flavescentibus haud definitis plagulas velutinas plus minusve orbiculares, vix con-

fluentes, 1.5–3 mm latas, atras, medio incrassatas, arachnoideo-marginatas efformans. Hyphae mycelii centrifugae, plerumque rectae, vix ramosae, fuscae, septatae, 6 μ crassae, hyphopodia alternantia, capitata, 2-cellularia gerentes, ca. 20 μ alt., cellula superiore subglobosa ca. 12 μ lata, hyphopodia mucronata haud conspicua. Perithecia in centro mycelii aggregata, versus basim verrucosula, atra, glabra, poro non pertusa, usque ad 250 μ diam., juxta basim setae plurimae erectae, nigro-fuscae, septatae, usque ad 150 μ alt., 9 μ crassae, ad apicem in ramos 4, raro 2 vel 3, erectos, plerumque recurvos, obtusos, haud denticulatos, 80–120 μ longos, 5 μ crassos, septatos, dilute fuscidulos furcatae. Asci elliptici, 2–4-spori. Sporae oblongae, utrinque rotundatae, 4-septatae, fuscae, 35–40 $\times$ 12–14 μ.

Ad folia *Ipomeae*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 407*.

Eine trefflich ausgebildete *Meliola*, von den beschriebenen Arten durch die Endteilung der Setae in 4 gleichmässig lange, hellere, an den Enden ganz stumpfe Aeste sehr abweichend. Selten sind es nur 2 Aeste, die sofort über der Bifurcation je wieder in 2 Aeste teilen. Sie gehört in die Verwandtschaft von *M. furcata* Gaill. und zunächst *M. patens* Syd. in Elmer, Leafl. Philipp. Bot. 5: 1538, von der sie sich durch 4-ästige Teilung und ungezähnelte Spitzen unterscheidet.

HYPOCREACEAE

OPHIONECTRIA ERINACEA Rehm sp. nov.

Perithecia in maculis hypophyllis vix conspicuis latissime flavidulis botryose 3–10 arcte congregata, sessilia, globulosa, 100 μ lat., hyalina, parenchymatice contexta, setis plurimis, rectis, subacutatis, non septatis, glabris, crasse tunicatis, medio canaliculatis, 50–100 $\times$ 5–6 μ inprimis ad apicem obsessa. Asci cylindraceo-clavati, apice rotundati, sessiles, crasse tunicati, usque ad 100 $\times$ 12 μ, 8-spori. Sporae subaciculares, utrinque valde acutatae, subcurvatae, hyalinae, 10–12-cellulares, usque ad 70 $\times$ 3 μ parallele positae. Paraphyses filiformes ad apicem ramosulae, hyalinae, 1.5 μ crassae.

Ad folia viva *Bambusae Blumeanae*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 36*.

Bewohnt fast ausschliesslich die Blatt-Unterfläche, doch sind die gelblichen Flecken auch auf der Oberseite bemerklich. Der Pilz ist herrlich entwickelt und durch den reichen farblosen Borsten-Ansatz gekennzeichnet.

MEGALONECTRIA PSEUDOTRICHIA (Schw.) Speg.

Ad lignum decorticatum.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 33*.

DOTHIDEACEAE

AUERSWALDIA MERRILLII P. Henn. in Hedwigia 47 (1908) 253.

In foliis *Freycinetiae Williamsii.*

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 396.*

Sporae modo hyalinae! Non rite ad *Auerswaldiam* pertinet, cfr. v. Höhnel, Fragm. Myc. 9: 53.

APIOSPORA APIOSPORA (Duv. & Mtg.) v. Höhnel Fragm. Myc. 8: 58.

Apiospora luzonensis P. Henn. in Hedwigia 47 (1908) 256, sporis paullulum longioribus.

Ad calamos emortuos *Bambusae Blumeanae.*

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 16 a* (var. *minor* Sacc. & Berh.).

Stellung nach v. Höhnel, Fragm. Myc. 8: 59 richtig bei den *Dothideaceae.*

PHYLLACHORA ? DIOSCOREAE Schwein. Syn. Am. Bor. No. 1924; Sacc. Syll. 2: 624.

Stroma epidermidi innatum, maculiforme, fibrillosum, tenerrimum, fusco-nigrum, maculae suborbiculares, striaeformes vel oblongae, 2–3 mm diam. Perithecia plus minusve dispersa, lenticularia, convexo-prominentia, minutissime papillulata, nigra, 0.15–0.2 mm lat. Asci fusiformes, sessiles, 50–60 × 15 μ, 8-spori. Sporae clavatae, 1-cellulares, hyalinae, 12–15 × 5–6 μ, distichae. Paraphyses filiformes.

Ad stipites emortuos *Dioscoreae.*

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 49.*

Die Perithecien sind dem zarten Stroma eingesenkt, einzeln, selten gehäuft und gut entwickelt. Die bei Saccardo gegebene Beschreibung von Schweinitz lässt sich recht gut auf den vorstehend beschriebenen Pilz beziehen, wenn auch Angaben über die Fruchtschicht fehlen. Cooke erklärt den Pilz von Schweinitz aber als Phoma mit 1-zelligen, elliptischen, 6–7 × 2.5 μ, farblosen Sporen.

PHYLLACHORA INFECTORIA Cooke (Cfr. Sacc. Syll. 8: 1913).

Ad folia viva *Ficus ulmifoliae.*

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 1.*

Stimmt im Allgemeinen gut zu der Beschreibung obiger Art, die aber nicht ganz ausreichend gegeben ist. Die Stromata liegen gesellig auf der Oberseite der Blätter in schwach gelblichen, zuletzt rötlichen, oft zusammenfliessenden Flecken, sind rundlich 0.2 mm breit. Schläuche cylindrisch, 60–80 × 8–10 μ. Sporen 1-reihig, länglich-elliptisch, an den Enden abgerundet, ohne Oeltropfen, 1-zellig, farblos, 8–10 × 4.55 μ. Paraphysen fadenförmig. *Phyllachora Ficium* Niessl. ist durch Stromata und Sporen sehr verschieden.

PHYLLACHORA ATROFIGURANS Rehm sp. nov.

Stromata epidermidi innata, nigra, plana, 0.3–1 mm diam., orbicularia, solitaria, dein in maculis ellipticis vel orbicularibus,

figuratis, usque ad 1 cm diam., longitudinaliter vel quadratim confluentia. Perithecia innata, globulosa, stroma minutissime papillulatum conoidea subelevantia, 0.12 mm diam. Asci fusiformes, sessiles, 35 × 10 μ, 8-spori. Sporae oblongae vel clavatae, 1-cellulares, hyalinae, 8–9 × 2.5–3 μ, 2–3-stichae.

Ad *Donacem canniformem* emortuum.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 55.*
Der Stengel wird durch den Pilz schön schwarz marmorrot.

BALANSIA VORAX (B. & C.) (Cfr. Atkinson Journ. Myc. 2 (1895) 256.)
Ophiodothis vorax (B. & C.) Sacc. Syll. 2: 652, var. *pilulaeformis* B. & C.

Ad folia viva *Panici carinati.*
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 326.*
Vollständing gleich Rehm Ascom. 924, auf *Panicum* aus Brasilien. Cfr. v. Höhnel Fragm. Myc. 12: 57.

SPHAERIACEAE

TRICHOSPHAERIA REGULINOIDES Sacc. Syll. 1: 454, var. **ARENGAE** Rehm var. nov.

Perithecia gregaria, in maculis fusco-nigritulis oblongis, usque ad 2 cm long. et lat., sessilia, globulosa, nigra, glabra, sicca apice umbilicata, poro pertusa, parenchymatice fusce contexta, ca. 150 μ lat., ad basim hyphis ramosis, subfuscis, septatis, 3–4 μ lat., mycelium formantibus obsessa. Asci clavati, teneri, 50 × 7 μ, 8-spori. Sporae cylindraceae, rectae, 1-cellulares, utrinque 1-guttulatae, hyalinae, 5–8 × 2–2.5 μ, superne 2- dein 1-stichae. Paraphyses nullae.

Ad petiolos emortuos *Arengae.*
LUZON, Prov Laguna, Los Baños, *C. F. Baker 17 a.*
Gehört zur Gruppe der unbehaarten, aber mit der Basis in einem Mycel sitzenden Trichosphaerien und stimmt im Allgemeinen zu der von Saccardo auf Holz in Borneo beschriebenen Art, die gleich grosse, aber mehr keulige, gekrümmte Sporen besitzt. *Trichosphaeria Sacchari* Massee (Sacc. Syll. 11: 294), kann auch nahe verwandt sein, hat aber nach der ungenügenden Beschreibung breitere Sporen. Unser Pilz dürfte als eigene Art zu erachten sein.

SPHAERELLACEAE

GUIGNARDIA FREYCINETIAE Rehm sp. nov.

Perithecia in utraque foliorum pagina dispersa, subdimidiata, convexula, nigra, minute papillulata, poro pertusa, glabra, excipulo membranaceo pseudoprosenchymatice, haud centrifuge contexto, fusco. Asci fusiformes, distincte stipitati, usque ad 70 × 9 μ, 8-spori. Sporae bacillares, rectae, infera parte acuta-

tae, 1-cellulares, hyalinae, ca. 25 × 2.5–3 μ, in asci superiore parte 3–4-stichae. Paraphyses filiformes, tenerae.

Ad folia emortua *Freycinetiae*.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 58*.

SPHAERULINA SMILACINCOLA Rehm sp. nov.

Perithecia in centro macularum orbicularium flavide-brunneolarum, haud distincte marginatarum, ca. 2 cm lat., interdum confluentium albido-cinerascente 0.5–1 cm lato, gregarie innata, dein sessilia, globulosa, glabra, poro pertusa, fusca, parenchymatice contexta, ca. 120 μ lat. Asci rosulati, clavato-ventricosi, sessiles, 40–50 × 10–12 μ, 8-spori. Sporae oblongae, rectae, primitus media, dein 3-septatae, cellulis plerumque magni-guttatis, haud constrictae, hyalinae, 20 × 4–5 μ, 2–3-stichae. Paraphyses nullae.

In pagina superiore foliorum vivorum *Smilacis*.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 91*.

Macht den vollen Eindruck einer *Mycosphaerella*, unterscheidet sich davon aber durch die 4-zelligen Sporen.

Sphaerella garganica Sacc. Syll.17: 644 an *Smilax* hat perithecia hypophylla und viel kleinere 2-zellige Sporen, auch ist keine Fleckenbildung angegeben. *Sphaerella smilacicola* (Schw.) Cooke (Cfr. Sacc. Syll. 1: 524) hat "macula rufo-fusca, nigro-marginata, sinuosa, impressa" und kleinere 2-zellige Sporen, welche aber in der Form, sowie die Schlauch-Grösse unserer Art ähnlich sind, so dass diese vielleicht als die völlig entwickelte *Sphaeria smilacincola* Schw. erachtet werden kann.

PLEOSPORACEAE

PHYSALOSPORA BAMBUSAE (Rabh.) Sacc. Syll. 1: 446.

Perithecia gregaria, longitudinaliter in striis usque ad 2 cm longis, intus atris innata, peridermium protuberantia, demum linealiter perforantia, globulosa, papillula minima prominente, atra, ad basim hyphis, fuscidulis obtecta, 0.15 mm diam., parenchymatice contexta. Asci clavati, usque ad 70 × 15 μ, 8-spori. Sporae oblongae, utrinque rotundatae, 1-cellulares, hyalinae, 15–18 × 7–8 μ, distichae. Paraphyses filiformes.

Ad *Bambusam Blumeanam* emortuam.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 16 b*.

Es ist zweifelhaft, ob der Pilz mit *Sphaeria Bambusae* Rabh. Hedwigia (1878) 45 identisch, denn dieser sagt "peritheciis stromate confluente passim erumpentibus, oblongis, ostiolo umbilicato, sporis (in ascis) 1-stichis, 9–11 × 5 μ in utraque pagina foliorum *Bambusae*." Möglicherweise hat Rabenhorst den unentwickelten Pilz beschrieben.

DIDYMOSPHAERIA MINUTELLOIDES Rehm sp. nov.

Perithecia gregaria, cortici interiori late denigrato insidentia, demum per epidermidem haud decolorotam prorumpentia globulosa, glabra, minutissime papillulata, nigro-fusca, parenchymatice crasse contexta, ca. 150 μ lat. Asci clavati, apice rotundati, teneri, 45–50 $\times$ 7 μ, 8-spori. Sporae clavatae, medio septatae et subconstrictae, cellula superiore latiore, inferiore angustata, fuscae, 7–8 $\times$ 2.5 μ, distichae. Paraphyses filiformes.

Ad petiolos emortuos *Arengae*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 17 b*.

Reiht sich offenbar eng an *Didymosphaeria minutella* Penz. & Sacc. Syll. 14: 555 an *Bambusa* in Java, welche aber "sporae obovatae, non constrictae" hat, während bei unserer Art diese ganz keulig, unten fast spitz sind und die Zellen sich leicht trennen.

MERRILLIOPELTIS HÖHNELII Rehm sp. nov.

Perithecia in maculis 5–9 mm latis, plus minusve arcte gregarie innata, epidermide clypeiformiter denigrata, 0.4–0.5 mm–2 cm diam., obtecta, demum denudata, globoso-lentiformia, substromatice posita, 0.25–0.3 mm diam., fusco-nigritula, ostiolo globuloso minimo prominente. Asci cylindracei, teneri, ca. 300 $\times$12–15 μ, 8-spori. Sporae fusiformes, rectae, utrinque acutatae, medio septatae, haud constrictae, utraque apice filiformiter 5 μ long. appendiculatae, hyalinae, 50–75 $\times$ 6–7 μ, distichae. Paraphyses filiformes perpaucae.

Ad petiolos emortuos *Arengae*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 52*.

Merrilliopeltis n. gen. ab P. Hennings in Hedwigia 47 (1908) 261 conditum et a cl. v. Höhnel, Ber. Kais. Ak. Wiss. Wien 121 in Fragm. Myc. 13: 54 rectificatum ad *Sphaeriaceas* juxta *Didymellam*, non ad *Hysteriaceas* relatum est. Ipsius auctoritate haec specimina huc ponuntur; a *M. Calami* P. Henn. sporis utrinque appendiculatis nec non clypeola denigrata epidermidis haud conspicue decidua differunt.

GNOMONIACEAE

CERATOSPHAERIA PHILIPPINARUM Rehm sp. nov.

Perithecia gregarie innata, dein emergentia, globulosa, 100–120 μ lat., parenchymatice fusce contexta, hyphis dispersis fuscidulis inprimis ad basim obsessa, usque ad 80 $\times$ 5–10 μ, in rostrum rectum, subcylindraceum, ad apicem acutatum et hyalinellum, fusco-nigrum, 1–1.5 mm longum, ad basim usque ad 60 μ

latum elongata. Asci fusiformes, sessiles, 60 × 15 μ, 8-spori. Sporae cylindraceo-clavatae, rectae, apice superiore rotundatae, medio septatae et subconstrictae, demum 3-septatae, hyalinae, 25–32 × 5–7 μ, 2–3-stichae. Paraphyses paucae, filiformes.

Ad vaginas *Bambusae Blumeanae*.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 8*.

MELANCONIDEAE

CRYPTOSPORA BAMBUSAE Speg. (Cfr. Sacc. Syll. 9: 940).

Ad fragmenta *Bambusae Blumeanae* emortuae in sylva.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 15 b*.

Die Zusammengehörigkeit dieses Pilzes mit dem aus Brazilien beschriebenen ist nach der Beschreibung sicher. Doch unterscheidet sich obiger als var. **Bakeriana** Rehm var. nov. durch 100–120 μ grosse Perithecien, spindelförmige 80 × 12–14 μ Schlauche und 65–70 × 4–4.5 μ, 4- (? zuletzt 8-) zellige, oben stumpfe, unten spitze Sporen. Paraphysen fehlen.

XYLARIACEAE

NUMMULARIA URCEOLATA Rehm sp. nov.

Stroma super corticem immutatum, modo versus lignum atratum circiter 10 cm long., 4–5 cm late expansum, ad marginem crassum obtusumque plus minus lobatum, atrum, glabrum, 1–2 mm crassum, usque ad marginem fructiferum, carbonaceum, intus atrum. Perithecia cylindracea, arcte juxtaposita, 0.5 mm lata. Asci? cylindracei evanidi. Sporae fusiformes, utrinque acutatae, rectae vel subcurvatae, fuscae, 1-cellulares, 12 × 4–5 μ. Tota stromatis superficies multipliciter 0.2–0.25 mm diam. urceolata, ibique papillulis hemisphaericis peritheciorum plane obtectorum coronata.

Ad lignum putridum.
LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 70*.

Eine wunderschön entwickelte *Nummularia*, abweichend von allen beschriebenen Arten durch ihr dickes, festes, schwarzes ausgebreitetes Stroma, dicht der Rinde angewachsen und oben überall bis in die wulstigen Ränder in kleinen runden Schüsselchen vertieft, in deren Mitte die rundliche Papille hervortritt.

HYPOXYLON DISJUNCTUM Rehm sp. nov.

Perithecia sessilia, rarissime solitaria, plerumque orbiculatim usque ad 2 mm diam. 5–15 arcte congregata, vix ad basim conjuncta, conoidea, glabra, subfusca, nigre papillulata, haud annulata, 0.3 mm diam. Asci cylindracei, p. sporif. 80 × 7 μ, 8-

spori. Sporae oblongae, utrinque obtusae, subcurvatae, 1-cellulares, fuscae, 8 × 3.5 μ, 1-stichae. Paraphyses filiformes.

Ad stipites emortuos *Bambusae Blumeanae* in sylvis.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 15a.*
Gehört nach der Sporen zur Gruppe von *Hypoxylon epiphloeum, H. luridum, H. rutilum,* gleicht aüsserlich dem *H. ochraceum,* ist aber durch Form und Gruppirung der Perithecien von allen verschieden.

HYPOXYLON FULVO-OCHRACEUM Rehm sp. nov.

Perithecia sessilia, primitus dispersa, dein orbiculatim 5–10 congregata, ad basim hyphis fuscis conjuncta, ceterum libera, glabra, conoideo-globosa, fulvo-ochracea, atre papillulata, haud annulata, 0.3 mm diam. Asci cylindracei usque ad 150 × 8 μ, 8-spori. Sporae ellipticae, subnaviculares, fuscae, 1-cellulares, 8–10 × 5 μ, 1-stichae. Paraphyses filiformes.

Ad caules emortuos *Bambusae Blumeanae.*
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 50.*
Aehnelt in Form und Lagerung des Perithecium dem *Hypoxylon disjunctum* Rehm, ist aber durch deren Farbe und die grösseren Sporen wesentlich verschieden.

XYLARIA BOTULIFORMIS Rehm sp. nov.

Stromata gregaria, cylindracea, apice obtuso breviter cylindrace mucronato sterili, recta vel subcurvata, 7–9 mm longa, 2–3 mm lata, atra, glabra, undique peritheciis arcte juxtapositis, hemiglobose prominentibus, poro perspicuo pertusis, breviter papillulatis, ca. 0.2 mm diam. obsessa, rugoso-scabra, intus alba, in stipitem subcylindraceum, longitrorse rugosum, 1.5 mm longe elongata. Asci cylindracei, perlongi, p. sporif. 35 × 5 μ, 7- vel 8-spori. Sporae ellipsoideae, rectae vel subcurvatulae, 1-cellulares, fuscae, 6–7 × 2.5 μ, 1-stichae. Paraphyses filiformes.

Ad lignum putridum.
LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 61.*
Eine auffällig kleine, vortrefflich entwickelte Art, der *Xylaria gracillima* P. Henn. (Sacc. Syll. 17: 691) sehr nahe verwandt, aber besonders durch winzige Perithecien ganz davon verschieden.

XYLARIA DEALBATA B. & Br.

In ligno putrido.
LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 68.*
Stimmt zur Beschreibung in Sacc. Syll. 1: 323 trefflich, hat aber leider weder Schläuche noch Sporen.

XYLARIA MYOSURUS Mont.

In ligno putrido.
LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 63.*

XYLARIA ALLANTOIDEA Berk.

In ligno putrido.
LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 69.*
Die richtige Bestimmung ist fraglich.

XYLARIA CORNIFORMIS Fr.

In ligno putrido.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 199.*

XYLARIA EUGLOSSA Fr.

Ad lignum emortuum in sylva.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 11.*

VALSACEAE

EUTYPA BAMBUSINA Penz. & Sacc.

Ad *Bambusam Blumeanam.*
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 10.*
Stromata nondum plane evoluta, ascis sporisque deficientibus.

EUTYPELLA GLIRICIDIAE Rehm sp. nov.

Stroma peridermio tectum, in cortice interiore effusum, nigrum, circa perithecia elevatum eaque ambiens. Perithecia in acervulis convexulis valsoide aggregata, 8–12 orbiculatim monosticha, globulosa, 0.3 mm diam., collis longis convergentibus praedita, papillulis cylindraceis, integris, 0.5–1 mm longis fasciculatim conjunctis per peridermium laciniatim fissum adhaerensque prorumpentia. Asci clavati, brevissime pedicellati, 25–30 × 5 μ, 8-spori. Sporae allantoideae, dilute flavidulae, 5–6 × 1.5 μ. Paraphyses nullae.

Ad ramulum emortuum *Gliricidiae sepium.*
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 47, 80.*
Der Ast ist ganz vom Stroma überzogen, die Perithecien-Lager grenzen eng aneinander, im Alter ist dadurch die schwarze innere Rinde davon ganz bedeckt. Durch die eng aneinander liegenden cylindrischen Papillen und kaum gestielten Schläuche von den beschriebenen Arten abweichend und nur der *Eutypella collariata* (C. & E.) Berlese Ic. 3: 76 nahe stehend.

EUTYPELLA AULACOSTOMA (Kze. & Fr.) Berlese Ic. 3: 65, *tab. 78, f. 2.*

Ad lignum emortuum in sylva.
LUZON, Prov. Laguna, Los Baños, *C. F. Baker 87.*

DIATRYPACEAE

DIATRYPE MEGALE Rehm sp. nov.

Stromata in cortice interiore late denigrato innata, dispersa, peridermio laciniatim disrupto et adhaerente cincta, oblongo-

orbicularia, 0.5–1.5 cm diam., 1 mm alta, margine sterili cincta, crasse nigre obtecta, intus albidula. Perithecia monostiche dense aggregata, globulosa, usque ad 0.5 mm diam., plurima, collis brevibus instructa, ostiolis hemiglobosis, demum sulcatis, poro perspicuis pertusis stroma superantibus. Asci fusiformes, longe tenuiter pedicellati, p. sporif. ca. 25×5 μ, 8-spori. Sporae allantoideae, dilute flavidulae, 6–7 × 2 μ. Paraphyses filiformes.

Ad ramum emortuum *Gliricidiae sepium*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 48*.

Die Stromata sind dick schwarz berandet und bedeckt, schliessen sich an *Diatrype Macounii* E. & E. (Berlese Ic. 3: 89, *tab. 120, f. 2*) zunächsten und gehört der Pilz zu den *Eudiatrypoideae* Berl. "stromate effuso, hinc inde pustulatim disciformiter elevato, extus nigro, intus a matrice valde heterogeneo, peritheciis eo immersis" l. c. p. 85.

MICROTHYRIACEAE

MICROPELTIS ? SCHMIDTIANA Rostrup (Cfr. Sacc. Syll. 17: 670).

Perithecia in maculis decoloratis, orbicularibus, epiphyllis ca. 1 cm latis gregarie sessilia, dimidiata, convexula, minutissime papillulata, poro pertusa, orbicularia, atra, glabra, 0.2 mm diam., pseudoprosenchymatice fusce, versus marginem haud radiatim violacee contexta. Asci clavato-fusiformes, sessiles, 50–52 × 12 μ, 8-spori. Sporae fusiformes, rectae, transverse 3–5-septatae, haud constrictae, hyalinae, 15–18 × 3-5 μ, 2-3-stichae. Paraphyses nullae.

In pagina superiore folii *Semecarpi cuneiformis*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 88*.

Gehört nach dem Bau seines schildförmigen Gehäuses zu der Abteilung von *Micropeltis* mit nicht am Rand faserig auslaufendem prosenchymatischen Gehäuse und steht jedenfalls der *M. Schmidtiana* Rostrup äusserst nahe, ebenso der *Micropeltis Rheediae* Rehm (*Phylloporina Rheediae* (Rehm) v. Höhnel Fragm. Myc. 14: 9).

? TRICHOPELTIS REPTANS Speg.

Ad folia *Ardisiae*.

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 408*.

Gänzlich unentwickelte Perithecien!

SEYNESIA CLAVISPORA Rehm sp. nov.

Maculae hypophyllae, primitus orbiculares, 4–8 mm diam., demum confluentes et late explanatae, nigrae ex hyphis centrifugis, rectis, septatis, vix ramosulis, 3–4 μ lat., hyphopodia non gerentibus, plus minusve dense contextae. Perithecia versus centrum maculae dispersa, dimidata, poro pertusa, centrifuge ex hyphis 4 μ cr., parallelis, subfusce contexta, glabra, usque ad 200 μ diam., radiatim in hyphas mycelii abeuntibus. Asci permulti, ovato-clavati, sessiles, apice crasse tunicati, 50–60 ×

25–30 μ, 8-spori. Sporae elongato-clavatae, apice superiore 5 μ cr., inferiore acutatae, medio septatae, non constrictae, hyalinae, demum brunneae, 35–40 μ long., parallele positae. Asci strato gelatinoso fuscidulo impositi obtectique. Hypothecium hyalinum.

Ad folia *Alyxiae moniliferae*.
Luzon, Prov. Laguna, Mount Maquiling, *C. F. Baker 398*.
Eine herrlich ausgebildete *Seynesia* mit auffallend nadelförmigen Sporen. Ausserhalb der Schläuche keimend werden dieselben 4-zellig. (Cfr. v. Höhnel Fragm. Myc. 10: 14.)

HYSTERIACEAE

LEMBOSIA POTHOIDEI Rehm sp. nov.

Mycelium epiphyllum, effusum, arachnoideum, arcte adnatum, ex hyphis fuscis, septatis, 5 μ cr., ramosis, hyphopodia pauca, subglobosa, 1-cellularia, 7–8 μ cr. gerentibus formatum, plagas nigritulas, usque ad 2 cm diam., orbiculares, centro demum peritheciis creberrimis obsessas, ambitu vix conspicuas figurans. Perithecia primitus dispersa, dein plus minusve arcte congregata, atra, carbonacea, glabra, raro orbicularia, plerumque elongata, utrinque obtusa, recta 0.4–0.5 mm long., 0.3 mm lat., apice longitudinaliter vel stellatim rimose dehiscentia, pseudoprosenchymatice centrifuge contexta, radiatim in mycelium basale transeuntia. Asci ovoidei, crasse tunicati, ca. 80 $\times$ 40 μ, 8-spori. Sporae ovoideae, medio aut paullulum inferius septatae, subconstrictae, hyalinae, dein brunneae, 25–27 $\times$ 12 μ. Paraphyses nullae nisi stratum intermedium hyalinum. Adsunt conidia oblonga, recta vel subcurvata, 1-cellularia, fusca, 30 $\times$ 6–7 μ, ut in *Lembosia Cassupae* P. Henn.

Ad folia *Pothoidei*.
Luzon, Prov. Laguna, Mount Maquiling, *C. F. Baker 405*.
Steht zunächst *Lembosia decalvans* Pat., unterscheidet sich aber vollständig durch Form und Anordnung der Peritchecien ? Richtiger wird die Stellung bei den Microthyriaceae zu suchen sein.

TRYBLIDIACEAE

TRYBLIDIELLA RUFULA (Spreng.) Sacc.

Ad lignum emortuum, et ad ramos emortuos *Citri*.
Luzon, Prov. Laguna, Los Baños, *C. F. Baker 32, 31*.

(B) DISCOMYCETES

STICTIDEAE

STICTIS ? THELOTREMOIDES Phill.

Ad petiolos emortuos *Coryphae elatae*.
Luzon, Prov. Laguna, Los Baños, *C. F. Baker 26*.
Stimmt gut zur Beschreibung.

BULGARIACEAE

OMBROPHILA SANGUINEA Rehm sp. nov.

Apothecia sparsa, sessilia, primitus cyathoidea, dein patellariformiter usque ad 1 cm lat. explanata, breviter crasse cylindrace albidule 0.5 mm long., 0.3 mm lat. stipitata, glabra, rubro-sanguinea, disco orbiculari crasse marginato plano, sicca subcomplicata, excipulo crasso sanguinee prosenchymatice contexto, gelatinoso. Asci clavati, apice rotundati, usque ad 130 × 10 μ, 8-spori. Sporae fusiformes utrinque acutatae, interdum subcurvatae, 1-cellulares, hyalinae, 20–24 × 3 μ, distichae. Paraphyses filiformes 1.5 μ, ad apicem complicatae, guttulis aureis repletae.

Ad lignum siccum in humo jacens.

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 59, 200.*

Steht im allgemeinen Bau der *Ombrophila rubescenti-rosea* Rehm (ex Sacc. Syll. 16: 767) recht nahe, unterscheidet sich aber durch Sporen und Paraphysen vollständig. Mit letzterer ist vielleicht identisch *Ombrophila roseola* Bres. (Sacc. Syll. 14: 802) ad terram limosam in Brasilia, hat aber 5–6 mm long, 1.5–3 mm breit gestielte Apothecien.

ASCOBOLEAE

ASCOPHANUS TESTACEUS (Moug.) Phill.

Ad corium dejectum.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 115.*

HELOTIACEAE

PHIALEA CYATHOIDEA (Bull.) f. CILIATULA Rehm.

Hyphae marginales excipuli distantes, filiformes, rectae, obtusae, subfuscidulae, scabrae, usque ad 30 × 3 μ. Sporae fusiformes, utrinque acutatae, 12–15 × 1.5–2 μ.

Ad petiolos emortuos *Cyatheae*.

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 62.*

Kann trotz des scheinbar behaarten Randes nicht von *P. cyathoidea* getrennt werden.

EUPEZIZACEAE

HUMARIA RAIMUNDOI Rehm sp. nov.

Apothecia solitaria, juvenilia fere cyathoidea, mox disco patelliformi, plano, crasse marginato, dein irregulariter explanato, demum vario modo complicato et extenso, sanguineo-rubra, extus glabra, subalbata, centro plus minusve late affixa, carnosa, 0.5–3 cm diam. Asci cylindracei, apice rotundata, usque ad 300 × 12 μ, 8-spori. Sporae ellipsoideae, utrinque rotundatae, glabrae,

hyalinae, 1-cellulares, guttis 1 vel 2 magnis praeditae, 15–18 × 8–10 μ, 1-stichae. Paraphyses filiformes, 2 μ, ad apicem 3 μ cr., hyalinae.

Ad lignum decorticatum.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 286*.

Die Apothecien liegen zuletzt ganz platt der Holzfläche auf. Der Pilz gehört in die Verwandtschaft von *Peziza bella* B. & C., *P. flavoaurantiaca* Rehm, *Humaria epitricha* Berk. und besonders der *Peziza inaequalis* B. & C. (Cfr. Cooke Mycogr. *Pl. 52, f. 204*), ist aber von diesen durch Mass und Grösse der Sporen, Farbe und Grösse der Apothecien verschieden. Die Paraphysen enthalten im frischen Zustand sicherlich rotes Oel.

LACHNEA ALBO-GRISEA Rehm sp. nov.

Apothecia gregaria, sessilia, primitus globoso-clausa, dein urceolata, demum disco orbiculari crasse marginato, extus pilis sparsis, rectis, fusiformiter utrinque acutatis, fuscis, 2–3-septatis, 120–150 × medio 12–15 μ obsessa, 1–2 mm alt., 1–3 mm diam., cinereo-alba, carnosa. Asci cylindracei, apice rotundati, 150 × 12–14 μ, 8-spori. Sporae subglobosae (in asco!) 1-cellulares, haud guttatae, glabrae, hyalinae, 12 × 10 μ, 1-stichae. Paraphyses filiformes, 2.5–3 μ, ad apicem usque ad 10 μ lat., hyalinae.

Ad humum ripae saxosae.

LUZON, Prov. Laguna, Los Baños, *Dr. E. B. Copeland*, comm. *C. F. Baker 323*.

Steht der *Peziza* (*Sarcoscypha*) *cretea* Cooke (Mycogr. 214, *Pl. 200, f. 362*) ziemlich nahe. An den blassen Apothecien sind die Haare sehr schwer erkennbar. Die Exemplare sind nicht völlig entwickelt.

PILOCRATERA HINDSII (Berk.) P. Henn. in Engl. Bot. Jahrb. 14: 363.

Trichopeziza sulcipes Berk. (Cfr. Sacc. Syll. 8: 161; Cooke Mycogr. 115, *Pl. 51, f. 200;* Massee in Journ. Linn. Soc. Bot. 31: 507.

Ad ligna emortua in sylva.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 287*.

Stimmt vortrefflich zur Beschreibung und Exs. Das Exemplar hat: Cupula usque ad 5 cm diam., stipes cylindricus 5 cm long., 4 mm lat. Discus ad marginem vix conspicue fimbriatus. Sporae ellipsoideae, utrinque subobtusae, primitus episporio longitudinaliter tenuissime striato, dein glabro, 1-cellulares, guttis oleosis magnis 2 praeditae, hyalinae, utraque apice minutissime papillulatae, 25–27 × 10–12 μ. (*Pilocratera celebica* P. Henn. in Monsunia mir unbekannt.)

PILOCRATERA SULCIPES Berk. var. **BECCARIANA** Ces. (Cfr. Sacc. Syll. 8: 162).

Ad ligna putrida in sylva.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 2*, "sordid-yellow in color;" ad lignum dejectum in sylva; *C. F. Baker 8*, "bright-red inside."

Unterscheidet sich durch etwas gefurchte, 1.5–2 mm breite, 0.5–1 cm lange Stiche, und ist aus Borneo bekannt.

PILOCRATERA TRICHOLOMA (Mont.) P. Henn. l. c. (Cfr. Cooke Mycogr. 116, *Pl. 51, f. 202;* Ferd. & Winge Bot. Tidsk. 30: 218, *f. 4.*)

Ad ligna emortua in sylva.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 12.*

Stimmt zu Cooke und Ferd. & Winge l. c., nur finde ich keine aderigen Rippen am Gehäuse: Cupula usque ad 2.5 cm diam., stipes cylindricus 2–3 cm long., 2 mm lat., excipulum pilis specificis rectis flavidulis dispersis usque ad 3 mm longis ubique, inprimis ad marginem obsessum. Sporae ellipsoideae, utrinque subacutatae, guttis oleosis magnis 2 praeditae, hyalinae, 30–32 × 12 μ. Patouillard (Ann. Myc. 4: 98) sagt: "sporae ovoideae, haud guttatae," und sah offenbar nur den unentwickelten Zustand.

THE PHILIPPINE JOURNAL OF SCIENCE, C. BOTANY
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DESCRIPTIONS OF SOME NEW PHILIPPINE FUNGI

By H. and P. SYDOW
(*Berlin, Germany*)

PUCCINIA PAULLULA Syd. sp. nov.

Maculis epiphyllis, indeterminatis, flavis; soris teleutosporiferis hypophyllis, irregulariter vel plus minus aequaliter densiusculeque distributis, subinde totam folii superficiem vel magnam ejus partem obtegentibus, minutis, vix 0.33 mm diam., sed saepe confluentibus et tunc usque 1 mm diam., compactiusculis, flavo-brunneis, tandem obscurioribus; uredosporis immixtis plerumque perfecte globosis, brunneis, modice obtuseque echinulatis, 20–26 μ diam., episporio 1.5 μ crasso; teleutosporis ellipsoideis, utrinque late rotundatis, medio valde constrictis, levibus, flavo-brunneis, ad apicem non vel levissime incrassatis, septo saepe oblique vel longitudinaliter posito, 20–24 μ longis, 18–21 μ latis, episporio tenui, loculis facillime secedentibus; pedicello sporam aequante vel superante, hyalino, deciduo.

On the lower surface of living leaves of *Amorphophallus sp.*

LUZON, Province of Laguna, Los Baños, *C. F. Baker 85*, September 25, 1912.

The species is very well marked by the comparatively small teleutospores and the very regular size and shape of both the uredospores and teleutospores. The thin epispore is of equal thickness in those teleutospores provided with an horizontal septum, but it is usually slightly thickened at the apex in such spores as are obliquely or vertically septate.

MYCOSPHAERELLA ALOCASIAE Syd. sp. nov.

Maculis amphigenis, orbicularibus vel suborbicularibus, 2–6 mm diam., zona fusco-purpurea limitatis, intus sordide albis; perithecciis in centro macularum dense et numerose aggregatis, globosis, atris, 60–80 μ diam., poro ca. 18–25 μ lato pertusis, contextu fuligineo; ascis fasciculatis, saccatis usque cylindraceis, 35–52 μ longis, 10–16 μ latis, octosporis, aparaphysatis; sporidiis distichis vel tristichis, cylindraceis, medio 1-septatis, non constrictis, utrinque obtusis, hyalinis, 16–18 μ longis, 3–5 μ latis.

On living or dying leaves of *Alocasia indica* Linn.

LUZON, Manila, *P. W. Graff*, December, 1911, distributed in *Fungi exotici exsiccati no. 30.*

GLOEOSPORIUM GRAFFII Syd. sp. nov.

Acervulis amphigenis, maculis magnis indeterminatis effusis confluentibus tandem magnam folii partem vel folium totum occupantibus albis distinctissimis insidentibus, in greges rotundatos ca. 1 cm latos primitus dispositis, tandem plus minus irregulariter distributis, erumpentibus, succineis, tandem atris, 70–130 μ diam.; basidiis dense stipatis, 10–15 μ longis; conidiis cylindraceis, saepe irregularibus, continuis, hyalinis, utrinque obtusis, 11–16 μ longis, 3.5–6 μ latis.

On living leaves of *Derris sp.* (aff. *D. ellipticae* Benth.).

MINDORO, San José, *P. W. Graff*, January, 1912, distributed in *Fungi exotici exsiccati no. 45.*

CERCOSPORA PUMILA Syd. sp. nov.

Maculis amphigenis, distinctissimis, orbicularibus vel irregularibus, 3–10 mm latis, subinde confluendo majoribus, linea fusco-purpurea elevata cinctis, rufo-fuscidulis, in hypophyllo pallidioribus; caespitulis epiphyllis, in macula densiuscule aequaliterque distributis, perexiguis, 40–55 μ diam., subatris; hyphis brevibus, simplicibus, continuis, raro 1-septatis, olivaceo-brunneolis, 15–25 μ longis, 3–4 μ crassis; conidiis filiformi-clavatis, sursum tenuatis, 2–8-septatis, subhyalinis, 30–88 μ longis, 1.5–2.5 μ latis.

On living leaves of *Derris sp.* (aff. *D. ellipticae* Benth.).

MINDORO, San José, *P. W. Graff*, January, 1912, distributed in *Fungi exotici exsiccati no. 47.*

HETEROSPORIUM CORYPHAE Syd. sp. nov.

Caespitulis amphigenis, effusis, folia ex toto occupantibus, obscure olivaceo-fuscis, tenuibus; hyphis flexuosis, simplicibus, usque 400 μ longis, 6–8 μ latis, remote septatis; conidiis acrogenis, primitus minutis 1-cellularibus, dein majoribus 1-septatis, tandem 2–3-septatis, non constrictis, olivaceo-fuscis minutissime denseque verruculosis vel potius tantum punctatis, maturis 15–27 μ longis, 8–11 μ latis, immaturis multo minoribus.

On leaves of *Corypha elata* Roxb.

MINDORO, San José, *P. W. Graff*, January, 1912, distributed in *Fungi exotici exsiccati no. 48.*

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THE PHENOMENON OF FATIGUE IN THE STIGMA OF MARTYNIA

By WILLIAM H. BROWN

(*From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.*)

The plants upon which the present observations were made were grown in the greenhouse of the department of botany of the Michigan Agricultural College during the spring of 1911. Here the plants were much smaller than in the garden during the summer months, but the flowers in the two cases appeared to be identical.

The single stigma of *Martynia proboscidia* Glox. terminates in two, thin, recurved lips. Shortly after the opening of the flower these two lips become sensitive to mechanical stimulation, and may be made to close together by applying to one of them a blow of sufficient force to cause it to bend. The process of closing requires only a few seconds. If the stigmas have not been pollinated the two lips will again spread apart and assume their original position and frequently in less than three minutes. When the stigmas are pollinated and the two lips then brought together as the result of mechanical stimulation, they will usually spread apart slightly in from ten minutes to an hour, after which they again close and remain so until they wither. It would seem that this closing together of the lips furnishes the pollen with excellent conditions for germination.

When pollen from tomato or squash plants was applied to the lips before they were brought together by mechanical stimula-

tion, the spreading was in some cases slightly retarded; but the lips resumed their original position and appeared to be as sensitive as if no pollen had been applied. Small quantities of quartz flour likewise had little or no effect on the movement or sensitiveness of the lips. These results seemed to show that those obtained with the *Martynia* pollen could not have been due to its weight acting as a mechanical stimulus but rather that it produced a chemical stimulation.

When the lips were completely covered with fine quartz flour and then made to close together, they only opened slightly, after which they again closed, as in the case of the *Martynia* pollen. At the same time as large a quantity of quartz sand as could be placed on the lips did not seem to retard their spreading or to have any effect in rendering them insensitive. The explanation of these phenomena is not at all clear. If the weight of the quartz flour could have been effective in holding the lips together the same thing should have been true of the sand. It may be noted here that Brown and Sharp [1] have found that continuous pressure was not effective in producing stimulation in the case of *Dionaea*. The results moreover could hardly have been due to any phenomena connected with growth. The best explanation would seem to be that there was a reduction in the turgor of the cells of the upper surface which was accompanied by an escape of water such as results from the stimulation of the pulvini of *Mimosa* and the stamens of the *Cynareae* and that this water was absorbed by the quartz flour and not by the sand. The quartz flour might then hold the water with sufficient force to prevent its return to the cells of the lips and thus not allow them again to become turgid. If this explanation is correct, movement would seem to be due to causes similar to those operative in the case of *Mimosa*. Here [2] there appears to be a reduction in the turgor of the cells of the concave half of the pulvini, which cells are probably compressed by those of the opposite turgid half.

The lips of the stigmas are usually much less sensitive on the day that the flowers open than on the two or three days following. They also spread apart much more slowly after closing, this process frequently requiring a number of hours. On the fourth or fifth or, sometimes, even on the third day they again become

[1] Brown, W. H., and Sharp, L. W. The Closing Response in Dionaea. Bot. Gaz. 49 (1910) 290–302.

[2] Brown, W. H. This Journal 7 (1912), Botany, 37.

very much less sensitive. Soon after this mechanical stimulation does not result in closure.

Owing to the rapidity with which the stigma lips respond to stimulation and then resume their original position they seemed to offer an easy method of determining whether or not such a structure would show phenomena of fatigue in any way similar to that exhibited by the muscles of animals. The spreading apart of the lips seemed especially favorable for this, as any retardation in the rapidity of this movement could be observed independently of any fatigue in the perception of stimulation. If this movement should show a phenomena resembling fatigue the time required for resuming the original position should increase after successive closures. In order to test this point stigmas of flowers one or two days old were selected. Since the stigma lips do not usually show a marked decrease in the rapidity with which, after having closed together, they resume the original position, until the fourth or fifth day, those one or two days old should have retained practically unimpaired the power of spreading apart for at least one or two days more if not stimulated. Results obtained on the first or second day of the experiment could therefore hardly be due to old age.

The method of experimentation consisted in causing the lips to close together as the result of mechanical stimulation and noting the time required for them to return to their original position. As soon as they did this they were again stimulated. The same process was repeated until the lips no longer responded.

It was found that the lips usually resumed the original position more quickly after the second or third closure than after the first, but beginning with the second or third stimulation they showed a marked tendency to do this more and more slowly after each successive closure. The increase in the time required for the process was quite gradual until it had been repeated a number of times. Finally, however, after a certain stimulus the time required for resuming the original position was increased very greatly, a number of hours being necessary. When the lips did spread apart after this, they either responded feebly or not at all to mechanical stimulation. If they did close, it again took a number of hours for them to spread apart and after this mechanical stimulation was always ineffective in causing closure. In Table I are given the results of a series of experiments which were all performed at the same time. These results are quite similar to those obtained from all other experiments.

TABLE I.—*Effect of successive stimuli on the time required for the spreading apart of the stigma lips of Martynia*

Stimulation No.	Time required for spreading—Plant No.—				
	1.	2.	3.	4.	5.
	Min.	*Min.*	*Min.*	*Min.*	*Min.*
1	11.5	19	29	28	-------
2	11	13	17.5	17.5	9.5
3	8	19	16	16	10
4	11.5	20	23	23	13
5	10	22	39	39	12
6	16	23	-------	-------	12
7	29	-------	-------	-------	17
8	-------	-------	-------	-------	15
9	-------	-------	-------	-------	23

From the results it would appear that the first few stimuli have a beneficial effect in that they result in an increased rapidity of movement. This phenomenon is paralleled to some extent in the case of striated muscles of animals where repeated stimulation results at first in increasingly greater contractions.

Beginning with the second or third stimulation, the stigma lips of *Martynia* spread apart, after closure, more and more slowly, thus showing a phenomenon resembling, at least superficially, one phase of fatigue in the striated muscles of cold-blooded animals. In the latter, fatigue is characterized by a decrease in the force of contraction and an increase in the periods of both shortening and relaxing.

Lee [3] distinguishes between fatigue and exhaustion in animal muscles. According to this author, fatigue appears to be due chiefly to poisoning by fatigue substances; exhaustion to the consumption of contractile material. The feeble response shown by the stigma lips of *Martynia* after a number of successive stimulations is superficially similar to exhaustion. A lack of knowledge of the mechanism of movement in *Martynia* makes it impossible to compare the phenomena observed in this case with those shown by animal muscles; but from what is known of the mechanism in other plants it would seem probable that movement is due to entirely different causes in the two cases and that this would also be true of fatigue. There is little evidence for or against the formation of fatigue substances in *Martynia;* but

[3] Lee, E. S. The nature of muscle fatigue. *Proc. Am. Physiol. Soc.* in *Am. Journ. Physiology* 2 (1899) 11.

it seems probable that the results observed are largely or wholly due to the disappearance of substances or conditions capable of producing the energy necessary for movement rather than to the inhibiting effects of substances formed as the result of movement. If the results were due, in any considerable degree, to the accumulation of fatigue substances, the movement should become gradually slower and slower and the stigma lips would probably not show such a sudden loss of the power of movement.

After the stigma lips of *Martynia* had responded to stimulation a number of times it was found that the force of the stimulus had to be increased in order to produce complete closure. It is not apparent as to whether this was due to a decrease in the power of perception or of movement or both. That the power of perception and movement may be separate is shown by the pulvini of *Mimosa*, which may be insensitive to mechanical stimuli but respond to heliotropic and other forms of stimulation.[4]

[4] Pfeffer, W. Physiology of Plants, translated by A. J. Ewart (1906).

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SOME ADDITIONAL BAMBOOS OF THE PHILIPPINE ISLANDS

By J. SYKES GAMBLE

(*East Liss, Hants, England*)

During the past year I have received for identification a considerable number of bamboos through Mr. E. D. Merrill and Mr. A. D. E. Elmer, most of which have proved to belong to species mentioned in my paper entitled "The Bamboos of the Philippine Islands."[1] For the species already enumerated a number of additional localities are here recorded, and several specimens bring additions to the list, additions of considerable interest which it is worth while to record. It has occurred to me that a list of the specimens identified may be useful as a supplement to my previous one. The numbers cited for each generic and specific name refer to those given in the previous list, additions being indicated by an asterisk.

1. *GUADUA Kunth

1. *GUADUA PHILIPPINENSIS Gamble sp. nov.

Culmus fruticosus, 4 ad 6 m altus, ad 5 cm diametro; internodia teretia, ad 75 cm longa; ramuli teretes, flores ac folia gerentes, vaginis glabris (juniores tantum in specimine adsunt). Folia membranacea, lineari-lanceolata, apice longe acuminata, basi saepissime rotundata, utrinque glabra, marginibus scabra, 10 ad 18 cm longa, 10 ad 15 mm lata, nervi utrinque 5 vel 6 haud conspicui; petiolus subnullus; vagina glabra vel paullo puberula apice auriculis perparvis albo-setiferis munita; ligula brevissima, saepe etiam setifera. Flores in racemis terminalibus vel ad nodos ramulorum ultimorum fasciculatis; racemi 5 ad 12 cm longi spicularum fasciculos alternatim gerentes et in quoque fasciculo spiculas 1 ad 3 fertiles saepissime deflexas cum paucis perparvis sterilibus et bracteis paleaceis parvis; rhachis gracilis, albo-pubescens, ad basim stramineo-bracteatus et ad nodos conspicue hirsutus. Spiculae oblongo-lanceolatae, glabrae vel minute albo-farinosae ad 15 mm longae, floribus circa 4 vel 5 fertilibus,

[1] This Journal 5 (1910) Bot. 267–281.

additis apicem versus 2 vel 3 incompletis; glumae steriles 2 ovatae acuminatae, I 3 mm longa, II 5 mm; glumae florentes III 5 ad 7 ovato-lanceolatae, mucronatae, 5 ad 8 mm longae; paleae glumae florenti longiores ovato-lanceolatae acuminatae dorso carinis conspicue alatis ciliatis munitae; lodiculae nullae. Stamina 6, linearia, libera vel juventute paullo convexa, antheris 3 ad 4 mm longis, obtusis, apice penicillatis. Ovarium oblongum, stylo gracili hirsuto, stigmatibus 3 plumosis brevibus. Caryopsis non visus.

MINDANAO, District of Davao, Mati, *C. V. Piper 475*, May 15, 1911.

This is a most interesting addition to the flora. As is well known, the genus *Guadua* differs but little from *Bambusa*, the chief character being in the broad wings to the keels of the palea. These are very well shown in Mr. Piper's specimen and in consequence I have described it under *Guadua*, a genus which hitherto has only been known as American. My only doubts are in the absence of lodicules and in the more *Dendrocalamus*-like ovary. Perhaps when ripe, or at any rate, more advanced, fruit is obtained it may be necessary to alter its position and genus and it is to be hoped that before long better specimens, including culm-sheaths, older spikelets, and the caryopsis may be obtainable.

2. BAMBUSA Schreber

2. BAMBUSA VULGARIS Schrad.

Add: LUZON, Province of Nueva Vizcaya, Dupax, *Bur. Sci. 11172 McGregor*, April, 1912: Manila, (cult.) *Merrill 7050*, March, 1910, the var. *striata* with striped culms. PALAWAN, Brooks Point, Addison Peak, *Elmer 12608*, February, 1911, "culms 6 to 9 m high, 7 to 10 cm in diameter, internodes 30 cm long."

3. BAMBUSA CORNUTA Munro.

Add: LUZON, Subprovince of Benguet, *Merrill 7711*, May, 1911: Province of Nueva Vizcaya, Dupax, *Bur. Sci. 11291 McGregor*, April, 1912: and amend the description "Culms 3.5 cm in diameter; internodes 40 to 50 cm long; culm-sheaths about 26 cm long, 15 cm wide, rounded above and with one or two horn-like auricles with long stiff bristles, the margins ciliate; pseudophylls reflexed, about 10 cm long, 1 to 2 cm broad, cordate at base; ligule very short."

5. BAMBUSA BLUMEANA Schultes.

Add: LUZON, Province of Nueva Vizcaya, Dupax, *Bur. Sci. 11372 McGregor*, April, 1912.

3. GIGANTOCHLOA Kurz

1. GIGANTOCHLOA SCRIBNERIANA Merr.

Add: CAMIGUIN DE MINDANAO, *Bur. Sci. 14696 Ramos*, April, 1912. LEYTE, Malitbog, *Weber 1527*, January, 1912.

2. *GIGANTOCHLOA ROBUSTA Kurz in Ind. Forester 1 (1876) 344?

LUZON, Province of Bulacan, Baliuag, *Bur. Sci. 9642 Robinson*, January, 1909. "Culms 13 to 15 m high, 8 to 9 cm in diameter; internodes 3.5 to

4 cm long; locally known as 'Bamboo de China' or 'Cauayan China' indicating a probably introduced species." I do not feel very certain of the identification as the plant described by Kurz is imperfectly known, and Koorders omits it from the Javanese species admitted in his "Exkursionsflora von Java."

5. *TEINOSTACHYUM Munro

A specimen of a bamboo without flowers, but with leaves and the culm-sheaths, agrees very nearly with *Teinostachyum Dullooa* Gamble in Ann. Bot. Gard. Calc. 7 (1896) 101, a widely spread Indian and Burmese bamboo found from the Sikkim Himalaya through Assam and Burma. Flowers should be carefully watched for.

MINDANAO, District of Zamboanga, *Merrill 8246*, December, 1911, "a slender tufted bamboo about 4 to 5 m high and 2 cm in diameter, the internodes 30 to 40 cm long, found in thickets near sea level."

6. SCHIZOSTACHYUM Nees

In the key line 3 for "lodicules none" insert "lodicules none or scarce" and line 10 after "hirsute" add "lodicules often present."

1. SCHIZOSTACHYUM ACUTIFLORUM Munro

Add: LUZON, Province of Laguna, Calauan, *McGregor*, December, 1910: Province of Nueva Vizcaya, Dupax, *McGregor*, March, 1912: Province of Laguna, Mount Maquiling, *For. Bur. 13236 Curran*, March, 1912. PALAWAN, Puerto Princesa (Mount Pulgar), *Elmer 12809*, March, 1911, "scandent and sprawling over river banks at 150 m alt., culms 2 to 4 cm thick."

2. SCHIZOSTACHYUM DIELSIANUM Merr.

Add: LUZON, Province of Tayabas, Cabibihan, *Bur. Sci. 13129 Foxworthy & Ramos*, March, 1911, along streams.

3. SCHIZOSTACHYUM PALAWANENSE Gamble.

In the description alter parts of lines 1 and 2 to "Culmus suffruticosus, alte scandens, prope basin solidus, 8 ad 25 mm diametro, internodia 20 ad 30 cm longa etc."

Add: PALAWAN, Brooks Point (Addison Peak), *Elmer 12618*, February, 1911.

4. SCHIZOSTACHYUM HALLIERI Gamble.

Add: PALAWAN, Brooks Point (Addison Peak), *Elmer 12599*, February, 1911, "culm-sheaths 17 to 18 cm long, truncate at apex, pseudophylls 7.5 cm long, 8 mm broad."

10. SCHIZOSTACHYUM FENIXII Gamble in Philip. Journ. Sci. 6 (1911) Bot. 289.

Add: LUZON, Abra Subprovince, Bangued, *W. E. McVey*, February and July, 1911, local name *puser*, a small bamboo with distant internodes; culm-sheaths very thick (3 to 4 mm) and woody, smooth and shining outside, 10 cm long, 3 to 3.5 cm in diameter at the base; pseudophylls ovate, acuminate, up to 10 cm long, 5 to 6 cm broad at the base, the base produced in large, rounded, fimbriate, wrinkled auricles: Province of Cagayan, Abulug River, *For. Bur. 17815 Curran*, January, 1912, "a climbing bamboo in dense tangled thickets along the river."

11. ***SCHIZOSTACHYUM LONGISPICULATUM** Kurz in Journ. As. Soc. Beng. 39² (1870) 89, *t. 6;* Ind. Forester 1: 351.

Melocanna longispiculata Kurz in Cat. Hort. Bog. (1866) 20.
Melocanna Zollingeri var. *longispiculata* Munro in Trans. Linn. Soc. 26 (1868) 134.

PALAWAN, Puerto Princesa (Mount Pulgar), *Elmer 12958*, April, 1911. I believe this identification to be correct.

12. ***SCHIZOSTACHYUM BRACHYCLADUM** Kurz in Journ. As. Soc. Beng. 39² (1870) 89, *t. VI, 2;* Ind. Forester 1: 349; Koord. Exkurs. Fl. Java 1: 179.

Melocanna brachyclada Kurz in Cat. Hort. Bog. (1866) 20.
Melocanna Zollingeri var. *brachyclada* Munro in Trans. Linn. Soc. 26 (1868) 134.

MINDANAO, Butuan Subprovince, Veruela, *C. M. Weber 1111*, June, 1911, "common along streams, culms 10 m high, up to 5 cm in diameter."

The specimens are very complete, having leaves, culm-sheaths, and good flowers, and they all agree well with specimens of *Schizostachyum brachycladum* Kurz in my possession, especially with one of Kurz's type sheets. The rounded, hard, shining culm sheaths with small, reflexed, fimbriate auricles and broadly ovate, cordate, sharply acuminate, short pseudophylls are very characteristic, as are the three, large, prominent lodicules and the obtuse anthers.

DINOCHLOA Büse

1. **DINOCHLOA SCANDENS** O. Kuntze.

Add: PALAWAN, Brooks Point (Addison Peak), *Elmer 12648*, February, 1911. SIBUYAN, Magallanes, *Elmer 12059*, March, 1910. CEBU, *Bur. Sci. 11115 Ramos*, March, 1912. LUZON, Province of Laguna, San Antonio, *Bur. Sci. 15015 Ramos*, June, 1912.

DINOCHLOA SCANDENS var. **ANGUSTIFOLIA** Hack.

Add: LUZON, Province of Tayabas, Lucban, *Elmer 9217*, May, 1907: Province of Cagayan, Abulug River, *For. Bur. 17816 Curran*, January, 1912: Subprovince of Bontoc, *Vanoverbergh 865*, in forests, altitude about 1550 meters, 5 m long, 2 to 3 cm in diameter, Ilocano *bica*.

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STUDIES ON PHILIPPINE MELASTOMATACEAE, I

By E. D. MERRILL [1]

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

A. THE GENUS MEMECYLON

The genus *Memecylon* is, in some respects, a peculiarly difficult one to study and no proposed scheme of classification of the numerous forms is entirely satisfactory either from the standpoint of interrelationships of the numerous forms, or from that of facility in making determinations. In the past decade abundant material has been collected in the Philippines, and a study of the available specimens has led me to make some radical changes in the nomenclature of some of our most common forms, and to alter the status of others. Very many of the specimens, in the light of this recent study, were originally erroneously determined, numerous forms, following other authors, being referred to the comprehensive *Memecylon edule* Roxb., as interpreted by Cogniaux. It has been considered advisable, under the circumstances, to cite specimens rather fully under each species as at present understood, in order that the duplicates, now widely distributed in numerous botanical institutions, can be rearranged in conformity with the present treatment, should the ideas embodied herein as to limits of species and nomenclature meet with acceptance.

The first Philippine species described were the two indicated by Blanco in 1837, *Memecylon parviflorum* Blanco, which in 1845 he altered to *M. tinctorium*, and *M. lanceolatum* Blanco. Neither have been understood by succeeding authors, although both are common species in Luzon, and the last name is valid under our rules of nomenclature. Both species have been here

[1] Associate Professor of Botany, University of the Philippines, Manila, P. I.

accepted, the first as a synonym of the form variously referred to *M. edule* Roxb., *M. ovatum* Sm., *M. prasinum* Naud., and *M. lucidum* Presl, here treated under *M. ovatum*, and the second as the proper name for the form later described by Presl as *M. cumingianum* and *M. pyrifolium*, and by Naudin as *M. clausiflorum*.

Soon after the distribution of Cuming's large Philippine collections the species of *Memecylon* represented were independently named and described, first by Presl [2] and immediately afterwards by Naudin.[3] Presl's names, so far as they were valid, antedate those of Naudin. The two sets of names and Cuming's specimens were correlated by Bentham in 1861 in his Botanical Memoranda, "The Memecyla of Cuming's collections," [4] Bentham's nomenclature being, for the most part, accepted and followed by later authors. Without discussing the species as considered by Triana and Naudin, in their monographs of the *Melastomataceae*, the next consideration of the Philippine forms as such is that of F.-Villar,[5] who admitted 14 species, of which 10 have never been found in the Philippines, and which were apparently all admitted on erroneously determined material. The latest monograph of the family, that of Cogniaux, published in 1891, credits 5 species to the Archipelago, which represents practically all that was known regarding the genus in the Philippines at that date. The list has, in the present paper, been increased to 30, most of the additions being in the nature of proposed new species, but also due to a different interpretation of some of the older species. There is evidence, in the material already collected, but inadequate for purposes of description, that the list will be considerably increased as botanical exploration of the Archipelago progresses. All of the following species belong in the section *Eumemecylon*.

In the preparation of this paper I am under obligations to Sir D. Prain, Director, Royal Gardens, Kew, England for the loan of fragments of cotypes of *Memecylon cumingianum* Presl, *M. lucidum* Presl, and *M. pyrifolium* Presl; and to Dr. A. Pascher of Prague, for the loan of a fragment of the type of *Memecylon diversifolium* Presl.

[2] Epim. Bot. (1851) 208–210.
[3] Ann. Sci. Nat. III 18 (1852).
[4] Journ. Linn. Soc. Bot. 5 (1861) 77, 78.
[5] Novis. App. (1880) 89, 90.

KEY TO THE SPECIES

1. Leaves boldly 3-nerved from base to apex, the marginal pair much more prominent than, and not at all arched between the ends of the pinnate lateral ones..... 1. *M. oligoneuron*
1. Leaves pinnately nerved to nerveless, the submarginal nerves, when present, always arched-anastomosing with the ends of the pinnate lateral ones.
2. Branches and branchlets terete, not at all angled or winged, and not even sulcate.
3. Leaves distinctly petioled, acute or rounded at the base, the nerves not prominent, sometimes obsolete.
4. Lateral nerves entirely obsolete, rarely slightly evident and then not at all anastomosing.
5. Peduncles very slender, up to 6 cm in length.... 2. *M. tenuipes*
5. Peduncles short, never more than 3 cm in length.
6. Inflorescence less than 1.5 cm long, few-flowered; leaves 5 cm long or less..... 3. *M. gitingense*
6. Inflorescence 2 to 7 cm long, many-flowered, leaves 6 to 12 cm long, always turning pale yellowish-green in drying. 4. *M. lanceolatum*
4. Lateral nerves slender, distinct but not prominent, usually distinctly or indistinctly anastomosing with the faint, arched, submarginal nerves.
5. Flowers fascicled or crowded in very shortly peduncled cymes, the whole inflorescence shorter than the petioles. 5. *M. odoratum*
5. Flowers in open, many-flowered more or less lax cymes which are always longer than the petioles.
6. Inflorescence distinctly dark brown-furfuraceous. 6. *M. subfurfuraceum*
6. Inflorescence entirely glabrous.
7. Leaves rounded at the base, very thickly coriaceous, shining, always brown or brownish when dry.. 7. *M. ovatum*
7. Leaves acute at the base, pale or olivaceous, not brown, when dry.
8. Inflorescence 2 cm long or less..... 8. *M. brachybotrys*
8. Inflorescence 3 to 6 cm long.
9. Lateral nerves evident, distinctly anastomosing. 9. *M. apoense*
9. Lateral nerves not or very indistinctly anastomosing. 10. *M. basilanense*
3. Leaves sessile or subsessile, distinctly cordate at the base, rarely merely rounded, the lateral nerves always prominent and anastomosing with the prominent, arched, submarginal nerves.
4. Leaves rounded, obtuse, or retuse at the apex. 11. *M. diversifolium*
4. Leaves acute or acuminate.
5. Leaves mostly less than 12 cm in length, the inflorescence quite glabrous, terminal and lateral..... 12. *M. affine*
5. Leaves 15 to 30 cm long, the inflorescence more or less furfuraceous, mostly lateral.

6. Nerves moderately prominent, about 15 on each side of the midrib, mostly 1 cm or more apart; leaves blunt-acuminate. 13. *M. cumingii*
6. Nerves very distinct, about 20 on each side of the midrib, mostly less than 1 cm apart; leaves acute or sharply acuminate..... 14. *M. phanerophlebium*

2. Branchlets distinctly and sharply 4-angled, narrowly 4-winged, or at least 2-sulcate, not strictly terete.
3. Lateral nerves prominent, anastomosing with the arched marginal nerves, the latter as prominent as the lateral ones.
4. Leaves gradually narrowed to the contracted, subcordate-rounded base, sessile, the stout branches and branchlets prominently 4-winged..... 15. *M. elongatum*
4. Leaves mostly broad and rounded or cordate, not or but little contracted to a narrow base.
5. Leaves mostly 10 cm long or less.
6. Leaves rounded at the base; peduncles very slender, 2.5 to 4 cm long..... 16. *M. loheri*
6. Leaves cordate; peduncles 2 cm long or less.
7. Lateral nerves 10 or less on each side of the midrib.
8. Peduncles 4-angled; inflorescence compound, many-flowered..... 17. *M. venosum*
8. Peduncles sulcate; inflorescence simple, subcapitate, few-flowered..... 18. *M. cordifolium*
7. Lateral nerves about 15 on each side of the midrib. 19. *M. subcaudatum*
5. Leaves exceeding 10 cm in length, mostly 15 to 25 cm long.
6. Leaves very thickly coriaceous, about 10 cm wide, the branchlets prominently 4-angled and winged.. 20. *M. sorsogonense*
6. Leaves thickly chartaceous to coriaceous, less than 10 cm wide.
7. Inflorescence lateral.
8. Ultimate branchlets sharply 4-angled or very narrowly winged; nerves very prominent.
9. Leaves olivaceous or brown, smooth when dry. 21. *M. paniculatum*
9. Leaves pale when dry, the lower surface especially so and minutely pustulate..... 22. *M. pallidum*
8. Ultimate branchlets 2-grooved, not 4-angled or 4-winged, the nerves not especially prominent.. 23. *M. calderense*
7. Inflorescence terminal or terminal and in the uppermost axils.
8. Peduncles 2 to 4 cm long, slightly grooved or sulcate. 24. *M. terminaliflorum*
8. Peduncles up to 10 cm in length, prominently 4-winged. 25. *M. pteropus*

3. Nerves obsolete, or if present not at all prominent and not or but obscurely anastomosing.
4. Leaves acute at the base.
5. Flowers fascicled or in very short, dense cymes.
6. Leaves sessile, about 12 cm long, their margins revolute; nerves distinct..... 26. *M. sessilifolium*

6. Leaves petioled, 4 to 10 cm long; nerves obsolete.
7. Leaves acuminate..... 27. *M. densiflorum*
7. Leaves rounded or obtuse..... 28. *M. obtusifolium*
5. Flowers few, in small, long and slenderly peduncled cymes; leaves lanceolate, less than 4 cm long, the lateral nerves obsolete..... 29. *M. gracilipes*
4. Leaves rounded or slightly cordate at the base.
5. Leaves rounded or obtuse at the apex, their margins revolute, base rounded..... 30. *M. revolutum*
5. Leaves distinctly acuminate, base usually slightly cordate. 23. *M. calderense*

1. **MEMECYLON OLIGONEURON** Blume Mus. Bot. 1 (1851) 353; Cogn. in DC. Monog. Phan. 7 (1891) 1132; Merr. in Philip. Journ. Sci. 4 (1909) 304.

Rhodamnia glabra Vid. Rev. Pl. Vasc. Filip. (1886) 129.

LUZON, Province of Cagayan, *For. Bur. 17074, 17242 Curran, For. Bur. 13100 Bernardo:* Province of Rizal, *Bur. Sci. 3314 Ramos:* Province of Laguna, *For. Bur. 22206 Mariano, For. Bur. 10111 Curran:* Province of Tayabas, *For. Bur. 18634 Darling, Vidal 782* (type of *Rhodamnia glabra* Vid., Herb. Kew.).

A most characteristic species, at once distinguished from all other Philippine forms by its prominently 3-nerved, not penninerved leaves.

Malay Peninsula, Penang, Java, and Borneo.

2. **MEMECYLON TENUIPES** sp. nov.

Arbor parva, glabra, circiter 5 m alta, ramis ramulisque tenuibus, teretibus; foliis lanceolatis, coriaceis, usque ad 10 cm longis, basi acutis, apice longe acuminatis, nervis lateralibus obsoletis; inflorescentiis axillaribus solitariis, ut videtur paucifloris, pedunculis tenuibus, 5 ad 6 cm longis; fructibus ovoideis, circiter 8 mm longis.

A small glabrous tree, about 5 m high, the branches reddish-brown or grayish, slender, terete, the branchlets terete, about 1 mm in diameter. Leaves lanceolate, coriaceous, the upper surface shining, the lower slightly paler, dull, 8 to 10 cm long, 1.5 to 2.5 cm wide, the base acute, the apex slenderly acuminate, the midrib distinct, but the lateral nerves and reticulations obsolete; petioles 2 to 3 mm long. Inflorescence axillary, solitary, long and slenderly peduncled, apparently few-flowered, the branches at the apex of the peduncle, short, the peduncle 5 to 6 cm long. Flowers unknown. Fruit (immature) green, ovoid, about 8 mm long.

LUZON, Province of Cagayan, Abulug River, *Bur. Sci. 13835 Ramos*, January, 1912, in forests along the river.

A species in the group with *Memecylon lanceolatum* Blanco=*M. cumingianum* Presl, but not closely allied to that species. Its alliance appears to be with *M. gracilipes* C. B. Rob., but it is entirely different from the latter in form and size of its leaves.

3. **MEMECYLON GITINGENSE** Elm. Leafl. Philip. Bot. 4 (1911) 1195.

MINDORO, *For. Bur. 8628 Merritt.* SIBUYAN, *Elmer 12189.*

A species of which the flowers are unknown, very similar to *Memecylon gracilipes* C. B. Rob., from which it differs in its somewhat larger leaves and especially in its very much shorter inflorescence. The Mindoro specimen is not quite typical, the leaves are a little winder than in the type, slightly different in texture, and the ultimate branchlets are frequently distinctly sulcate.

4. **MEMECYLON LANCEOLATUM** Blanco Fl. Filip. (1837) 301, ed. 2 (1845) 209.

Memecylon pyrifolium Presl Epim. (1851) 210.

Memecylon cumingianum Presl l. c. 209; Triana in Trans. Linn. Soc. **28** (1871) 156; Cogn. in DC. Monog. Phan. 7 (1891) 1168.

Memecylon clausiflorum Naud. in Ann. Sci. Nat. III **18** (1852) 274; Miq. Fl. Ind. Bat. 1^1 (1855) 577; Walp. Ann. **4** (1857) 803.

LUZON, Subprovince of Benguet, *Elmer 6342:* Province of Zambales, *Merrill 2995:* Province of Bulacan, *For. Bur. 7171 Curran:* Province of Laguna, *Bur. Sci. 14929, 16528 Ramos:* Province of Bataan, *For. Bur. 1304, 1781 Borden, For. Bur. 17312 Curran, Bur. Sci. 6174 Robinson, Merrill 2563, Leiberg 6163;* Corregidor, *For. Bur. 13221 Curran:* Province of Rizal, *Loher 6248, For. Bur. 1101, 1162 Ahern's collector, Guerrero 12, Phil. Pl. 377 Ramos, Merrill 1687, 2633:* Province of Sorsogon, *For. Bur. 4527 Zschokke.* POLILLO, *Bur. Sci. 10266 McGregor.* NEGROS, *For. Bur. 5572 Everett.*

The species is common and widely distributed in the regions from which Blanco secured most of his botanical material. It is, in general, very similar to some other species, and is the only species known to me that agrees with the original description of *Memecylon lanceolatum* Blanco, and at the same time differs from the manifestly similar forms found in the same region by its somewhat larger flowers, a character especially noted by Blanco. F.-Villar reduced *Memecylon lanceolatum* Blanco to *M. cumingianum* Presl, and I am now of the opinion that he was correct in determining the two to be identical. I have, however, retained Blanco's specific name on the principle of priority.

Memecylon pyrifolium Presl was based on *Cuming 1816,* from the Island of Bohol, and although it was retained by Bentham[6] as a distinct species, Cogniaux is apparently correct in reducing it to *Memecylon cumingianum* Presl=*M. lanceolatum* Blanco.

Memecylon cumingianum Presl was based on *Cuming 917,* from the Province of Albay, Luzon, and this specific name was retained by Cogniaux, and is the oldest one other than Blanco's.

Memecylon clausiflorum Naud. was based on specimens collected by *Cuming* in the Philippines, the number or numbers not indicated. In the Museum of Natural History at Paris, *Cuming 917, 1151,* and *1816,* are all named *M. clausiflorum* Naud; *No. 1151,* however, is probably *M. subfurfuraceum* Merr.

The species is rather characteristic, but has not been well understood here, for some of the specimens cited above have been determined as *M. cumingianum* Presl, and others as *M. edule* Roxb. The leaves are

[6] Journ. Linn. Soc. Bot. **5** (1861) 78.

always more or less greenish-yellow when dry, and the lateral nerves are obsolete or nearly so. The inflorescence is entirely glabrous, and the flowers are somewhat larger than in any of the allied species having more or less similar vegetative characters. The reinstatement of Blanco's species as a valid one invalidates the Bornean *Memecylon lanceolatum* Cogn., for which the new name **MEMECYLON BORNEENSE** is proposed.

Memecylon calleryanum Naud. in Ann. Sci. Nat. III 18 (1852) 275; Walp. Ann. 4 (1857) 803; Miq. Fl. Ind. Bat. 1[1] (1855) 577=*Memecylon cumingianum* Presl var. *calleryanum* Cogn. in DC. Monog. Phan. 7 (1891) 1168. This form was based on a specimen collected in the Province of Pangasinan, Luzon, by *Callery*. From the description, in connection with our ample material of *M. lanceolatum* Blanco, I can see no reason for distinguishing it. The differential characters are in the size of the leaves and length of the inflorescence. I have little hesitation in considering Naudin's species a synonym of Blanco's *Memecylon lanceolatum*, but a critical study of the type may alter this opinion.

Memecylon cumingianum Presl=*M. lanceolatum* Blanco is also found in Borneo and in Celebes, *fide* Cogniaux.

5. **MEMECYLON ODORATUM** Elm. Leafl. Philip. Bot. 4 (1911) 1196.

PALAWAN, *Elmer 13140* (type collection).

The species is well characterized by its terete branchlets, obtuse or rounded, petioled leaves, and fascicled, not cymose inflorescence. It does not appear to be closely allied to *M. sessilifolium* Merr., to which it was compared.

Endemic.

6. **MEMECYLON SUBFURFURACEUM** sp. nov.

Arbor parva, usque ad 8 m alta, inflorescentiis fusco-furfuraceis exceptis glabra; ramis ramulisque teretibus; foliis chartaceis vel subcoriaceis, oblongo-ovatis ad ovato-lanceolatis, penninerviis, acuminatis, basi acutis, petiolatis, usque ad 14 cm longis, nitidis, subtus pallidioribus, nervis utrinque circiter 12, tenuibus, indistinctis, obscure anastomosantibus; cymis axillaribus, solitariis, pedunculatis, multifloris, 3 ad 5 cm longis, alabastro obtuso.

A small tree 5 to 8 m high, quite glabrous except the rather densely brown-furfuraceous inflorescence. Branches and branchlets slender, terete, grayish to reddish-brown. Leaves oblong-ovate to ovate-lanceolate, penninerved, chartaceous to subcoriaceous, 10 to 14 cm long, 3.5 to 6 cm wide, olivaceous-brown when dry, shining, the lower surface a little paler than the upper, the apex rather slenderly acuminate, the acumen sharp or somewhat blunt, the base acute; lateral nerves about 12 on each side of the midrib, slender, not prominent, anastomosing with the very slender and indistinct marginal nerves; petioles 3 to 4 mm long. Cymes 3 to 5 cm long, axillary, solitary, peduncled, many-flowered, all parts in anthesis rather densely

furfuraceous with small dark-brown scales, the peduncles terete or very obscurely angled, 0.5 to 2 cm long. Flowers blue or purplish, numerous, crowded in subglobose heads on the ends of the ultimate branchlets, the buds subglobose, obtuse, the pedicels about 3 mm long. Calyx about 2 mm in diameter, truncate, very obscurely 4-toothed, somewhat broadly funnel-shaped, about 2 mm in diameter. Petals ovate, 1.6 mm long, acute or obtuse. Filaments 2.5 mm long. Fruit globose, dark-purple when mature, the pericarp fleshy, when dry about 6 mm in diameter.

LUZON, Province of Nueva Ecija, *For. Bur. 22417 Alvarez:* Province of Pangasinan, *For. Bur. 9624 Zschokke:* Province of Pampanga, *Merrill 1395, For. Bur. 17737 Curran:* Province of Batangas, *For. Bur. 7657, 7922, Curran & Merritt:* Province of Bataan, *For. Bur. 5776, 7155, 17607, Curran, Merrill 2495, 3788* (type), *Whitford 83, 299, 1022, Elmer 6723, 6796, Williams 225, 656, 728, For. Bur. 82, 206 Barnes, For. Bur. 730, 820, 1185 Borden, For. Bur. 2191 Meyer, Bur. Sci. 1647, 1887 Foxworthy.*

A species previously confused with *Memecylon edule* Roxb., most of the specimens cited having been determined as that species and the duplicate material so distributed. It is more closely allied to *Memecylon acuminatum* Sm., and to *M. grande* Retz., as interpreted by Cogniaux, than to *M. edule*. It is readily distinguishable by its dark brown-furfuraceous, not glabrous, inflorescence. The species is rather local, and most of the numerous specimens cited above are from a single locality, that is, Lamao River, Province of Bataan, Luzon. *Cuming 1151*, referred by Cogniaux to *Memecylon cumingianum*, is probably *M. subfurfuraceum*.

Var. **DEPAUPERATUM** var. nov.

A typo differt foliis minoribus, 5 ad 8 cm longis, cymis brevioribus, vix 2 cm longis, minus furfuraceis.

LUZON, Province of Rizal, *For. Bur. 1992 Ahern's collector* (type), *Loher 6034:* Province of Tayabas, *Merrill 1936.*

In essential characters this form appears to be very closely allied to typical *Memecylon subfurfuraceum*, and although it differs from the species not only in its smaller leaves but also in its shorter and less furfuraceous inflorescence, I have considered it best to indicate the form merely as a variety of the above species rather than as a distinct one. Two or three other specimens, in different stages and scarcely directly comparable, may be referable here.

Memecylon edule Roxb. has been credited to the Philippines by several different authors, F.-Villar, Vidal, Cogniaux, and myself, but it is exceedingly doubtful if the species really extends to the Archipelago, and equally doubtful if it should be interpreted as a broad collective species as Cogniaux[1] has considered it. It seems to me that Cogniaux has referred to *Memecylon edule* Roxb. several forms that are worthy of specific rank, and I have no hesitation in so considering the one form that extends to the Philippines, *M. edule* var. *ovatum* C. B. Clarke=*M. ovatum* Sm.

[1] DC. Monog. Phan. 7 (1891) 1155.

The exact identity of the typical form of *Memecylon edule* Roxb. is more or less doubtful, as his figure is not particularly good, and his description is unsatisfactory. Trimen [8] met with difficulty in trying to interpret the species, and concluded that it was safer not to employ Roxburgh's name for any Ceylon species; he referred *M. edule* var. *ovatum* C. B. Clarke to *M. grande* Retz., as a variety.

If Cogniaux is correct in his synonymy of the species, the oldest valid specific name is *Memecylon umbellatum* Burm. f. Fl. Ind. (1768) 87, in spite of the fact that Trimen states that Burmann's name was published without description. Although Burmann's description consists of but five words, it constitutes a valid publication by reference to "Burm. *zeyl. 76, t. 30,*" and the figure referred to is the type of the species. *Samara laeta* L. Mant. 2 (1771) 199, being based on the same reference as *Memecylon umbellatum,* becomes an exact synonym. However, Trimen considers that *Memecylon umbellatum* Burm. f. is specifically distinct from *M. edule* Roxb., in which I agree with him, after an examination of the literature involved, and the Ceylon material available here. Whether or not true *Memecylon edule* Roxb. extends to the Philippines may be a question of dispute, but it seems to be very evident that nothing closely approaching *Memecylon umbellatum* Burm. f. is found in the Archipelago.

A very great number of Philippine specimens, collected within the past decade, have been determined and for the most part the duplicate material distributed as *Memecylon edule* Roxb. Among the specimens so named several distinct species are represented, but most of the material is referable to *M. subfurfuraceum* Merr. and to the form considered below.

7. **MEMECYLON OVATUM** Sm. in Rees Cycl. 23 (1816) No. 3; Benth. in Journ. Linn. Soc. Bot. 5 (1861) 78.

Memecylon parviflorum Blanco Fl. Filip. (1837) 300; Cogn. in DC. Monog. Phan. 7 (1891) 1172.

Memecylon tinctorium Blanco l. c. ed. 2 (1845) 208, non Koenig.

Memecylon lucidum Presl Epim. (1851) 209.

Memecylon prasinum Naud. in Ann. Sci. Nat. III 18 (1852) 275.

Memecylon edule Roxb. var. *ovatum* C. B. Clarke in Hook. f. Fl. Brit. Ind. 2 (1879) 564.

BATANES ISLANDS, Dalupiri, *Bur. Sci. 10643 McGregor.* LUZON, Province of Ilocos Sur, *Bur. Sci. 10070 McGregor:* Province of Nueva Ecija, *For. Bur. 8446, 8485 Curran:* Province of Pangasinan, *Merrill 2878, For. Bur. 8378 Curran & Merritt:* Province of Zambales, *Merrill 2087, For. Bur. 6936 Curran:* Province of Rizal, *For. Bur. 1838 Ahern's collector, Loher 3528:* Province of Laguna, *For. Bur. 11980 Tamesis, For. Bur. 22342 Mariano:* Province of Batangas, *For. Bur. 21568 Tamesis:* Province of Tayabas, *For. Bur. 13367 Aguilar, For. Bur. 10246 Curran, For. Bur. 15269, 19005 Rosenbluth:* Province of Camarines, *Ahern 800.* PALAWAN, *For. Bur. 4508, 7461 Curran.* MINDANAO, Province of Misamis, *For. Bur. 19544 Klemme:* District of Davao, *Copeland 689:* District of Zamboanga, *Ahern 656, Bur. Sci. 11783 Robinson.* BASILAN, *For. Bur. 6574 Hutchinson.*

The Philippine form seems to be quite identical with the Indo-Malayan one which is represented in the herbarium of the Bureau of Science by

[8] Fl. Ceyl. 2 (1894) 221.

several specimens variously identified as *Memecylon tinctorium* Koen., *M. edule Roxb.*, and *M. minutiflorum* Miq., INDIA, *Meebold 8652*, MALAY PENINSULA, *Ridley 15396*, PENANG, *Ridley*, and specimens from Ceylon and Lingga cultivated in the Botanic Garden at Buitenzorg.

As to my interpretation of *Memecylon ovatum* Sm., I must confess that I have followed Cogniaux, as the one description of Smith's species available, that given by DeCandolle, is altogether too short to supply an adequate idea of the species. Smith's type should be examined and compared with the abundant Indian material now available.

As to the synonyms quoted above, both *Memecylon lucidum* Presl and *M. prasinum* Naud. were based on Philippine material, and both on a single number of Cuming's collection (No. 1445), although the number was not cited by Naudin. *Memecylon parviflorum* Blanco, which in the second edition of his "Flora de Filipinas" Blanco changed to *M. tinctorium*, is manifestly this form with ovate leaves. The species seems to be widely distributed in the Indo-Malayan region, and is well characterized by its rather thickly coriaceous leaves which are brown and shining when dry, and in comparison with the preceding by its entirely glabrous, not furfuraceous inflorescences.

8. MEMECYLON BRACHYBOTRYS sp. nov.

Species M. apoensi affinis, differt inflorescentiis brevioribus, haud 2 cm longis, paucifloris, floribus minoribus, calycis 3 mm diametro, petalis 3 mm longis.

A small tree, 8 to 10 m high, all parts glabrous. Branches and branchlets terete, slender, grayish, or the younger parts somewhat reddish-brown. Leaves ovate to elliptic-ovate, coriaceous, penninerved, shining, 12 to 15 cm long, 5 to 8 cm wide, narrowed to the rather long-acuminate apex, the acumen stout, blunt, and to the acute base, the upper surface olivaceous when dry, the lower somewhat paler, margins slightly revolute, lateral nerves indistinct, slender, not anastomosing, about 12 on each side of the midrib, the midrib very prominent; petioles 5 to 7 mm long. Inflorescence axillary, peduncled, cymose, 1 to 2 cm long, rather dense, few-flowered, the peduncles about 5 mm long, usually solitary, sometimes fascicled, the flowers 5 to 10 on each inflorescence, their pedicels 2 to 3 mm long. Buds shortly acuminate, hardly rostrate. Calyx cup-shaped, truncate, obscurely and minutely 4-toothed, 3 mm long and wide. Petals triangular-ovate, acute, 3 mm long. Filaments and anthers each about 2 mm long. Fruit ellipsoid, about 1.5 cm long, 0.8 to 1 cm in diameter.

LUZON, Province of Rizal, Bosoboso, *For. Bur. 3070 Ahern's collector* (type), May 27, 1905, *Bur. Sci. 2631 Ramos*, May, 1907: Province of Laguna, Paete, *Bur. Sci. 10011 Ramos*, July, 1909, *For. Bur. 19279 Curran*, Feb., 1910.

The species, among the Philippines forms, is manifestly allied to *Memecylon apoense* Elm., from whcih it differs in its much shorter inflorescence

and smaller flowers. Among the extra-Philippine species its place appears to be with *Memecylon violaceum* Cogn., of Borneo, and *M. garcinioides* Blume of Sumatra. A specimen from Camiguin de Mindanao, *Bur. Sci. 14683 Ramos*, is very similar to *M. brachybotrys*, but has subglobose or ovoid rather than ellipsoid fruits.

9. **MEMECYLON APOENSE** Elm. Leafl. Philip. Bot. 4 (1911) 1199.

MINDANAO, District of Davao, *Elmer 11697* (type collection).

The species is rather characteristic and is certainly distinct from *Memecylon edule* Roxb., and its allied forms. It is characterized by its unusually large flowers, which are described as having the calyx 5 mm long and wide and the petals 6 mm long. In my material of the type collection, however, the calyx scarcely exceeds 3 mm in length and 4 mm in diameter, while the petals are at most 5 mm in length. Even with these corrected measurements, the flowers still are rather large for the genus.

10. **MEMECYLON BASILANENSE** sp. nov.

Arbor parva, glabra, ramis ramulisque teretibus; foliis subellipticis, utrinque angustatis, 9 ad 18 cm longis, basi acutis, apice crasse obtuseque acuminatis, crassissime coriaceis, in siccitate pallidis, nitidis, penninerviis, nervis utrinque circiter 10, indistinctis, vix anastomosantibus; cymis axillaribus, solitariis vel fasciculatis, pedunculatis, laxis, circiter 5 cm longis, multifloris; calycibus truncatis, 4 mm diametro; petalis latissime ovatis, apiculatis, circiter 3.5 mm longis.

A small glabrous tree, the branches and branchlets terete, light-gray, or the latter somewhat brownish. Leaves subelliptic to broadly elliptic-ovate, thickly coriaceous, 9 to 18 cm long, 5 to 9 cm wide, rather pale yellowish-green when dry, sometimes subolivaceous, shining, the lower surface often a little paler than the upper, narrowed at both ends, the base acute, the apex with a stout, blunt acumen 1 cm long or less; lateral nerves about 10 on each side of the midrib, slender, indistinct, not anastomosing, the reticulations obsolete; petioles stout, 2 to 3 mm long. Cymes axillary, solitary or fascicled, 4 to 6 cm long, the peduncles and branches obscurely 4-angled, the former 2 to 3 cm long. Flowers numerous, rather laxly disposed, their pedicels 3 to 4 mm long. Calyx broadly urceolate-scutelliform, truncate, not toothed, 4 mm in diameter, about 3 mm long. Petals orbicular-ovate, abruptly apiculate-acuminate, 3.5 to 4 mm long. Filaments 3.5 mm long; anthers 1.5 mm long.

BASILAN, *Bur. Sci. 16146 Reillo* (type), September, 1912, *For. Bur. 18915 Miranda*, September, 1912.

A species probably most closely allied to *Memecylon grande* Retz., although not referable to that species, judging from the descriptions available. It might conceivably be placed in the division indicated by Cogniaux with 1-nerved leaves, that is, those forms with the lateral nerves obsolete or nearly so, in which case its alliance would be with *M. inter-*

medium Blume. Although the lateral nerves are indistinct and the reticulations are obsolete, I am of the opinion that its proper place is near *M. grande* Retz.

11. **MEMECYLON DIVERSIFOLIUM** Presl Epim. (1851) 208; Triana in Trans. Linn. Soc. 28 (1871) 156; F.-Vill. Novis. App. (1880) 90; Cogn. in DC. Monog. Phan. 7 (1891) 1149.

The type of this species was an unnumbered specimen from Cuming's Philippine collection, and authors subsequent to Presl have interpreted it from Presl's description, not from an examination of his type specimen. The description is inadequate, so that from it alone it is impossible properly to interprete the species. Dr. A. Pascher of Prague has kindly supplied me with a leaf of the type specimen for examination. As this fragment cannot exactly be matched by any of our abundant Philippine material, but does closely resemble specimens of *Memecylon caeruleum* Jack, from the Malay Peninsula, it is suspected that the type of *Memecylon diversifolium* is really a part of Cuming's No. 2322 which was from Malacca and not from the Philippines. In the fragment examined the lateral nerves are not at all prominent, while the leaves are sessile and cordate, so that the species cannot be placed with the three Madagascar species in Cogniaux's arrangment, but falls naturally in the same group with *M. caeruleum*, under that authors scheme of classification. The fragment is to be compared directly with Cuming's specimen of *M. lutescens* Presl=*M. manillanum* Naud.=*M. caeruleum* Jack.

12. **MEMECYLON AFFINE** Merr. in Govt. Lab. Publ. (Philip.) 35 (1906) 52, Philip. Journ. Sci. 1 (1906) Suppl. 108.

LUZON, Province of Bataan, *Whitford 454, For. Bur. 1336 Borden, Merrill 3190, Leiberg 6059, For. Bur. 17318 Curran, Williams 425:* Province of Rizal, *Loher 6241, 6261:* Province of Bulacan, *Bur. Sci. 13030 Ramos:* Province of Zambales, *Bur. Sci. 5075 Ramos.*

This species is very closely allied to *Memecylon cumingii* Naud. (*M. preslianum* Triana) from which it differs chiefly in its smaller, fewer-nerved leaves. In shape, texture, etc., the leaves are quite similar, the ultimate branchlets are terete, and the inflorescence is much as in *M. cumingii*, although more often terminal than lateral, while in *M. cumingii* the inflorescence is mostly lateral, very rarely both lateral and terminal.

Var. **LANCIFOLIUM** var. nov.

A typo differt foliis lanceolatis, usque ad 9 cm longis, 1.5 ad 2.5 cm latis.

LUZON, Province of Bataan, *Merrill 2184:* Province of Rizal, *Bur. Sci. 2661 Ramos.*

13. **MEMECYLON CUMINGII** Naud. in Ann. Sci. Nat. III 18 (1852) 273 (*cummingii*); Miq. Fl. Ind. Bat. 1[1] (1855) 573; Walp. Ann. 4 (1857) 802.

Memecylon umbellatum Presl Epim. (1851) 208, non Burm. f.
Memecylon preslianum Triana in Trans. Linn. Soc. 28 (1871) 157; F.-Vill. Novis. App. (1880) 90; Vid. Phan. Cuming. Philip. (1885) 114; Cogn. in DC. Monog. Phan. 7 (1891) 1139.

LUZON, Province of Cagayan, *Bur. Sci. 10753 Worcester:* Province of Tayabas, *Cuming 760* (cotype of *M. cumingii* and *M. preslianum*): Prov-

ince of Laguna, *Bur. Sci. 10006, 12017, 15080, 16613, 16655 Ramos.* Pollillo, *Bur. Sci. 9274 Robinson.*

There is no apparent reason why Naudin's specific name should not be adopted, as it is not, according to the International Code of Botanical Nomenclature, invalidated by *M. cumingianum* Presl. The use of both the specific name *cumingii* and *cumingianum* to designate two different species in the same genus might cause some confusion, but, as is shown in the present paper, Presl's *Memecylon cumingianum* is no longer valid, but becomes a synonym of *M. lanceolatum* Blanco.

This characteristic endemic species, aside from its elongate, thickly coriaceous, prominently nerved, cordate leaves, is distinguished from allied forms by its somewhat brown-furfuraceous inflorescence and by its entirely terete ultimate branchlets.

14. MEMECYLON PHANEROPHLEBIUM sp. nov.

Arbor parva, inflorescentiis parcissime furfuraceis exceptis glabra, ramis ramulisque teretibus; foliis coriaceis, nitidis, oblongis ad oblongo-ellipticis, sessilibus, usque ad 18 cm longis, nervis submarginalibus prominentibus, nervis lateralibus circiter 20, anastomosantibus, apice acute acuminatis, basi cordatis; cymis axillaribus, pedunculatis, solitariis, 2 ad 3 cm longis.

A small tree, about 5 m high, glabrous except the inflorescence. Branches and branchlets terete, rather stout, brown. Leaves sessile, oblong to oblong-elliptic, coriaceous, 13 to 18 cm long, 5 to 8 cm wide, base broadly rounded, cordate, apex rather sharply but shortly acuminate, both surfaces shining when dry, the upper olivaceous, the lower a little paler; lateral nerves about 20 on each side of the midrib, prominent, brown, anastomosing with the slightly arched submarginal nerves, the latter as prominent as the lateral ones. Cymes solitary, axillary, peduncled, 2 to 3 cm long, slightly brown-furfuraceous, many-flowered, the peduncles 1 cm long or less. Flowers umbellately disposed on the ultimate branchlets, their pedicels 2 mm long, the bracteoles triangular-ovate, acute or acuminate, about 1 mm long. Calyx about 3 mm in diameter, 2.5 mm high, broadly funnel-shaped, truncate, not at all toothed. Petals broadly ovate, obtuse or acute, 2 to 2.5 mm long.

Leyte, mountains back of Dagami, *Bur. Sci. 15375 Ramos*, August, 1912, said to grow in the mossy forest.

A species manifestly very closely allied to *Memecylon paniculatum* Jack, as here interpreted, but distinguished by its more numerously nerved leaves and closer nerves.

15. MEMECYLON ELONGATUM sp. nov.

Arbor parva, glabra; ramulis quadrangulatis, quadrialatis; foliis crasse coriaceis, nitidis, oblongis vel anguste oblongis, breviter acuminatis, sessilibus, basi angustata rotundato-subcordatis, 20 ad 35 cm longis, 3.5 ad 7 cm latis, nervis lateralibus

tenuibus, quam nervulae transversales non magis prominentibus; inflorescentiis axillaribus, circiter 3 cm longis, a rhachis basi apiceque radiato-ramosis; floribus in apice ramulorum umbellatis.

A small tree, glabrous throughout. Branches stout, the older ones terete, the younger ones 4-angled, the ultimate ones about 5 mm thick, 4-angled and distinctly 4-winged, the wings about 1.5 mm wide. Leaves narrowly oblong or oblong, thickly coriaceous, shining when dry, pale-brownish, 20 to 35 cm long, 3.5 to 7 cm wide, apex shortly acuminate, base somewhat narrowed, narrowly subcordate-rounded; transverse nerves 35 to 40, straight, spreading, not prominent, not more distinct than are the submarginal, slightly arcuate, longitudinal nerves, the midrib prominent; petioles almost obsolete, stout. Inflorescence axillary, 3 cm long or less, radiately branched from the base and also from the apex of the short rachis, the flowers purple, in rather dense umbels at the thickened apices of the branches, their pedicels 2 to 3 mm long. Calyx 2 mm in diameter.

MINDANAO, District of Zamboanga, Port Banga, *For. Bur. 9383 Whitford & Hutchinson*, January, 1908.

A species well characterized by its elongate, coriaceous leaves, which are subsessile, narrowed and somewhat rounded-cordate at the base, and by its numerous, not prominent lateral nerves which are about as prominent as the submarginal longitudinal ones, and its prominently 4-winged branchlets. It is allied to *Memecylon paniculatum* Jack, but is very different from that species.

16. MEMECYLON LOHERI sp. nov.

Species M. venoso affinis, differt foliis minus crassioribus, basi rotundatis vix cordatis, inflorescentiis longe graciliterque pedunculatis, subsimplicibus, paucifloris, pedunculis gracilibus, obscure angulatis.

An erect shrub or small tree, quite glabrous, the branches terete, grayish-brown, slender, the branchlets usually brownish, very slender, distinctly 4-angled. Leaves chartaceous, ovate to oblong-ovate, 5 to 7 cm long, 2.5 to 3.5 cm wide, narrowed above to the rather slender acumen, the base rather broadly rounded, not cordate, somewhat shining when dry, usually olivaceous, not brown, the lower surface somewhat paler than the upper; lateral nerves prominent, slender, 7 to 10 on each side of the midrib, anastomosing with the somewhat arched submarginal nerves, the latter as prominent as the lateral ones; petioles 2 mm long or less. Inflorescence axillary, solitary, long-peduncled, cymose, the peduncles very slender, about 0.5 mm in diameter, obscurely angled, 2.5 to 4 cm long, the branchlets subumbellately

arranged at the apex, the flower-bearing part of the inflorescence 1.5 cm long or less. Flowers rather few, small, pedicelled, their pedicels 1 to 1.5 mm long, the subtending bracteoles about 0.5 mm long. Calyx funnel-shaped, about 2 mm long and wide, truncate, obscurely 4-toothed. Petals 1.5 mm long. Buds acute.

LUZON, Province of Rizal, Oriud, *Loher 6278* (type), August, 1905; Mount Susong Dalaga, *Bur. Sci. 13594 Ramos*, August, 1911: Province of Cagayan, Caua Volcano, *R. N. Clark*, August, 1908.

A characteristic species, similar to and manifestly allied to *Memecylon venosum*, but readily distinguished by the characters indicated in the diagnosis. The ultimate branchlets are 4-angled and narrowly 4-winged, which places the species, according to Cogniaux's arrangement, near *M. paniculatum* Jack, to which *M. loheri* is otherwise not especially closely allied.

17. **MEMECYLON VENOSUM** Merr. in Philip. Journ. Sci. 3 (1908) Bot. 154.

MINDANAO, District of Lanao, Camp Keithley, *Mrs. Clemens 432, s. n., For. Bur. 15454 Pray:* District of Zamboanga, *Merrill 8100*.

Endemic.

18. **MEMECYLON CORDIFOLIUM** sp. nov.

Frutex glaber, 2 ad 3 m altus, ramis teretibus, ramulis distincte 4-angulatis vel sulcatis; foliis sessilibus, ovatis ad oblongo-ovatis, coriaceis, 7 ad 10 cm longis, nitidis, sursum angustatis acuminatisque, basi latissime rotundatis, distincte cordatis, nervis utrinque circiter 10, distinctis, anastomosantibus, inflorescentiis axillaribus terminalibusque, solitariis, subcapitatis, paucifloris, pedunculo 1 ad 2 cm longo.

A glabrous shrub 2 to 3 m high, the branches terete, brown, the branchlets slender, distinctly 4-angled or sulcate, not winged. Leaves sessile, ovate to oblong-ovate, coriaceous, 7 to 10 cm long, 3 to 6 cm wide, narrowed from below the middle to the acuminate apex, the base very broadly rounded, cordate, when dry shining on both surfaces, the upper surface brownish-olivaceous, the lower much paler; lateral nerves about 10 on each side of the midrib, slender, distinct but not particularly prominent, anastomosing with the somewhat arched submarginal nerves, the latter as prominent as the lateral ones. Inflorescence axillary and terminal, solitary, peduncled, of very much reduced, subcapitate, few-flowered, simple cymes, the peduncles slender, somewhat sulcate, not 4-angled, up to 2 cm long, the flower-bearing part of the inflorescence subglobose, less than 1 cm in diameter. Calyx cup-shaped, about 3 mm in diameter, truncate, very obscurely 4-toothed, the pedicels at most 2 mm in

diameter, mostly arising from one or at most two places on the peduncle.

MINDANAO, District of Zamboanga, Port Banga, *For. Bur. 9383 Whitford & Hutchinson*, November, 1907.

A well marked species characterized by its sessile, rather pale, cordate, acuminate leaves, and its much reduced, few-flowered cymes which are subcapitate and at most 1 cm in diameter. It somewhat resembles some forms of *Memecylon affine* Merr., but is not closely allied to that species, being readily distinguished from it and its allied forms by its 4-angled, not terete branchlets. Its true alliance seems to be with *M. venosum* Merr., and *M. paniculatum* Jack, but it is very different from both.

19. MEMECYLON SUBCAUDATUM sp. nov.

Frutex 3 ad 4 m altus, inflorescentiis exceptis glaber, ramis teretibus, ramulis tenuibus, brunneis, distincte 4-angulatis; foliis late lanceolatis, coriaceis, usque ad 10 cm longis, breviter petiolatis, basi rotundatis subcordatisque, apice subcaudato-acuminatis, nervis utrinque circiter 15, distinctis, cum nervis submarginalibus arcuato-anastomosantibus; cymis axillaribus, solitariis, paucifloris, circiter 2 cm longis.

A shrub 3 to 4 m high, glabrous except the inflorescence. Branches slender, terete, brown, the branchlets similar but distinctly 4-angled. Leaves broadly lanceolate, coriaceous, shining when dry, the upper surface pale-olivaceous, the lower pale-brownish, 8 to 11 cm long, 2.5 to 4 cm wide, narrowed above to the subcaudate-acuminate apex, somewhat narrowed below to the rounded, slightly cordate base; lateral nerves about 15 on each side of the midrib, prominent on the lower surface, anastomosing with the arched, prominent, submarginal nerves, the reticulations distinct, very lax; petioles stout, about 2 mm long. Cymes solitary, in the axils of fallen leaves, few, about 2 cm long, somewhat brown-furfuraceous, the peduncles about 1.5 cm long. Flowers few, their pedicels about 2 mm long, the calyx immediately after anthesis distinctly urceolate, the limb somewhat spreading, truncate, about 3 mm in diameter.

CAMIGUIN DE MINDANAO, Mount Mahinog, *Bur. Sci. 14689 Ramos*, April, 1912, in forests.

A species manifestly allied to *Memecylon paniculatum* Jack, but distinguished by its much smaller, slenderly acuminate, narrower leaves and few-flowered cymes.

20. MEMECYLON SORSOGONENSE Elm. Leafl. Philip. Bot. 4 (1911) 1200.

LUZON, Province of Sorsogon, *Elmer 7310*. LEYTE, *Elmer 7361*.

Manifestly allied to *Memecylon cumingii* Naud. (*M. preslianum* Triana), which it resembles in vegetative characters, but from which it is distinguished by its mostly terminal, longer, quite glabrous, not at all furfuraceous inflorescence.

21. **MEMECYLON PANICULATUM** Jack in Malay Misc. 2 (1822) 62; Hook. Comp. Bot. Mag. 1: 219; Triana in Trans. Linn. Soc. 28 (1871) 157; F.-Vill. Novis. App. (1880) 90; Cogn. in DC. Monog. Phan. 7 (1891) 1136.

LUZON, Province of Zambales, *Hallier s. n.:* Province of Bataan, *Williams 326, 502, Whitford s. n., For. Bur. 5942 Curran:* Province of Bataan, *Bur. Sci. 1010, 4645, 4574 Ramos, For. Bur. 3188 Ahern's collector, Loher 6283:* Province of Laguna, *Bur. Sci. 9750 Robinson, For. Bur. 12693 Rosenbluth & Tamesis.* MINDORO, *For. Bur. 3721, 6147, 8658, 9972 Merritt, Bur. Sci. 945 Mangubat, Merrill 5604.* NEGROS, *For. Bur. 15162 Tarrosa.* MINDANAO, District of Lanao, *Mrs. Clemens 1140:* District of Zamboanga, *Merrill 8094.*

The type of this species is probably not extant, and as I have not seen the original description, or Hooker's reprint of it, my conception of the species is based on Cogniaux's description. The form here considered as referable to Jack's species is widely distributed in the Philippines and is characterized by its prominently 4-angled, slender, ultimate branchlets, and its lateral inflorescence. In a note made by myself at Kew some years ago, attached to one of the specimens cited above I have observed that our Philippine material agrees better with Javan specimens (*Zollinger 443*) than with *Cuming 889* from the Philippines, both cited by Cogniaux as representing Jack's species. *Memecylon calderense* A. Gray, reduced to *M. paniculatum* Jack by Cogniaux, certainly represents a specifically distinct form. Even removing this form from *Memecylon paniculatum* Jack, the material cited above, as representing Jack's species, presents considerable variation.

22. **MEMECYLON PALLIDUM** sp. nov.

Species M. paniculato valde affinis, differt foliis subtus pallidis minute pustulatis, inflorescentiis cymosis sed floribus dense aggregatis, ad apices ramulorum capitato dispositis.

A small tree, glabrous except the somewhat brown-furfuraceous inflorescence. Branches terete, brownish, the branchlets slender, distinctly 4-angled, or near the uppermost node narrowly winged. Leaves oblong to narrowly oblong-ovate, coriaceous, 12 to 18 cm long, 4 to 8 cm wide, pale and shining when dry, the lower surface decidedly paler than the upper, minutely and rather densely pustulate, the apex sharply acuminate, the base broadly rounded, cordate; lateral nerves about 15 on each side of the midrib, very prominent on the lower surface, anastomosing with the somewhat arched, prominent, submarginal nerves; petioles 2 mm long. Inflorescence axillary, solitary, cymose, about 4 cm long, the peduncle 2 cm long or less and with the radiating branches 4-angled and sparingly brown-lepidote, the branches usually about 6, umbellately arranged, up to 1.8 cm long, each bearing at its apex a head of numerous pedicelled flowers, the thickened apical part of the branches about 5 mm in diameter. Pedicels 2 to 2.5 mm long. Calyx broadly funnel-

shaped, truncate, not at all toothed, 2 mm in diameter. Petals about 1.3 mm long. Buds obtuse or broadly and obtusely apiculate. Berry broadly ovoid, obtuse.

BASILAN, *Bur. Sci. 15401 Reillo* (type), August, 1912, in forests, *Hallier s. n.*, January, 1904 (sterile).

A species very similar to and manifestly closely allied to *Memecylon paniculatum* Jack, as here interpreted, differing especially in its decidedly pale leaves which are minutely pustulate on the lower surface, not entirely smooth and brown as in the material referred to Jack's species.

23. **MEMECYLON CALDERENSE** A. Gray Wilkes U. S. Explor. Exped. 15 (1854) 574, *pl. 71;* Merr. in Philip. Journ. Sci. 3 (1908) Bot. 83.

LEYTE, *Elmer 7246.* MINDANAO, District of Zamboanga, *Wilkes Expedition* in U. S. National Herbarium, *Hallier s. n., For. Bur. 9215 Whitford & Hutchinson.* BASILAN, *Hallier s. n.*

This species, although manifestly allied to *Memecylon paniculatum* Jack, is certainly specifically distinct. It is readily distinguished by its much less prominently nerved leaves, the marginal nerves not at all prominent, and its terete, or obscurely sulcate but not 4-angled ultimate branchlets. It was reduced to *Memecylon paniculatum* Jack by Triana, in which he was followed by Cogniaux. The type was from the small settlement of Caldera a few miles north of Zamboanga, and between Zamboanga and San Ramon.

24. **MEMECYLON TERMINALIFLORUM** Elm. Leafl. Philip. Bot. 4 (1911) 1198.

PALAWAN, *Elmer 13060* (type collection). Doubtfully referable here are also *For. Bur. 13700 Curran,* from Negros, and *Bur. Sci. 13105 Foxworthy & Ramos,* from Tayabas Province, Luzon.

The species is similar in many respects to *Memecylon pteropus* Merr., but differs essentially in its much shorter inflorescences, the peduncles and branches grooved, not 4-angled, and not at all winged as in *M. pteropus.*

25. **MEMECYLON PTEROPUS** sp. nov.

Arbor parva, circiter 5 m alta, glabra; ramis teretibus, ramulis acute quadrangulatis, 4-alatis; foliis coriaceis, nitidis, oblongo-ovatis, brevissime petiolatis, basi late cordatis, apice acuminatis, usque ad 13 cm longis, 3-nerviis, nervis transversalibus prominentibus, rectis, utrinque circiter 12; inflorescentiis terminalibus, paniculatis, rhachibus ramulisque prominenter 4-alatis; fructibus globoso-ovoideis, purpureis, circiter 7 mm diametro.

A small tree, quite glabrous, the branches terete, reddish-brown, the branchlets sharply 4-angled, narrowly 4-winged, the ultimate ones 2 to 3 mm in diameter. Leaves oblong-ovate, coriaceous, shining, subsessile, the petioles 2 mm long or less, the base broadly rounded-cordate, narrowed from the middle or the lower third upward to the acuminate apex, 7 to 13 cm long, 3 to 13 cm wide; lateral longitudinal nerves distinct, slightly

undulate, as prominent as the lateral transverse nerves, the latter straight, about 12 on each side of the very prominent midrib. Inflorescence paniculate, terminal, usually two terminating each branchlet, one in each leaf-axil, in fruit up to 20 cm long, the peduncle 10 cm long or more, prominently and thinly 4-winged, the branches few, spreading, whorled, the lower ones about 5 cm long, 4-winged. Flowers unknown. Fruit purple, globose-ovoid, about 7 mm in diameter.

LUZON, Province of Cagayan, Abulug River, *Bur. Sci. 13846 Ramos*, January, 1912, in forests near Dabba.

A species similar to *Memecylon affine* Merr., *M. paniculatum* Jack, *M. preslianum* Triana, etc., but well characterized by its thinly but prominently 4-winged elongate rachis of the inflorescence.

26. **MEMECYLON SESSILIFOLIUM** Merr. in Philip. Journ. Sci. 5 (1910) Bot. 209.

LUZON, Province of Nueva Ecija, *For. Bur. 22155 Alvarez*, December, 1910: Province of Camarines, *For. Bur. 18734 Darling*, April, 1910.

A very characteristic endemic species.

27. **MEMECYLON DENSIFLORUM** Merr. in Philip. Journ. Sci. 3 (1908) Bot. 248.

Memecylon palawanense Elm. Leafl. Philip. Bot. 4 (1911) 1197.

LUZON, Province of Cagayan, *For. Bur. 18482 Alvarez:* Province of Rizal, *Loher 6031, 6032, 6239:* Province of Tayabas, *For. Bur. 18694 Darling.* POLILLO, *Bur. Sci. 10259 McGregor.* MINDORO, *For. Bur. 5323, 5432, 5509 Merritt, Merrill 2251.* PALAWAN, *Elmer 13235* (type number of *M. palawanense*). LEYTE, *For. Bur. 12740 Rosenbluth.* MINDANAO, Province of Surigao, *Bolster 368* (type), *Ahern 515:* District of Lanao, *Mrs. Clemens s. n.:* District of Zamboanga, *Bur. Sci. 16380 Reillo, For. Bur. 9418, 9187, 9189, 9455 Whitford & Hutchinson.*

The species as here interpreted shows considerable variation, but the variation is chiefly in the size of the leaves, the maximum size in the specimens here referred to *M. densiflorum* being about 10 cm long and 4 cm wide; in the type and in *M. palawanense* they are much smaller, 5.5 cm long and 2.5 cm wide, but in the abundant material available all intergrades can be found between the sizes indicated above. The flowers are sometimes fascicled, sometimes in short-peduncled cymes, both types being usually found on the same specimen. The ultimate branchlets are usually distinctly 4-angled, sometimes, however, merely sulcate on two sides and not evidently angled, as in *M. palawanense;* all intergrades occur. The types of *M. densiflorum* and *M. palawanense* are not absolutely identical, but I have not detected sufficient constant differences to warrant keeping them separate.

28. **MEMECYLON OBTUSIFOLIUM** sp. nov.

Frutex glaber, circiter 3 m altus, ramis teretibus, ramulis junioribus distincte sulcatis, haud 4-angulatis; foliis petiolatis, crasse coriaceis, obovatis ad oblongo-obovatis, usque ad 4 cm longis, apice late rotundatis, interdum retusis, vel obtusis, basi

angustatis, acutis, nervis lateralibus obsoletis; inflorescentiis ut videtur cymosis, brevissime pedunculatis, axillaribus, quam petioli vix longioribus; fructibus depresso-globosis, 5 mm diametro.

An erect glabrous shrub about 3 m high, the branches terete, the branchlets slender, distinctly sulcate on two sides, not 4-angled or winged. Leaves thickly coriaceous, brown when dry, somewhat shining, the lower surface a little paler than the upper one, obovate to oblong-obovate, 2.5 to 4 cm long, 1.5 to 2.5 cm wide, the apex broadly rounded, sometimes retuse, or obtuse, narrowed below to the acute base, the margins somewhat revolute when dry; nerves obsolete; petioles 2 to 4 mm long. Flowers unknown. Peduncles axillary, solitary, 2 to 3 mm long, the whole inflorescence apparently scarcely exceeding the petioles in length. Fruit depressed-globose, 5 mm in diameter.

LUZON, Province of Pangasinan, Equia, *For. Bur. 8295 Curran & Merritt,* December, 1907, on dry ridges, altitude about 200 m.

A well marked species, characterized by its obovate, nerveless, rounded or obtuse leaves and its very short inflorescence.

29. **MEMECYLON GRACILIPES** C. B. Rob. in Philip. Journ. Sci. 6 (1911) Bot. 353.

LUZON, Province of Ilocos Norte, *Bur. Sci. 7753 Ramos.*

Endemic.

30. **MEMECYLON REVOLUTUM** sp. nov.

Arbor parva, glabra, circiter 4 m alta, ramis ramulisque teretibus; foliis ellipticis, crasse coriaceis, nitidis, usque ad 10 cm longis, basi late rotundatis, apice obtusis vel late brevissime acuminatis, breviter petiolatis, margine revolutis, nervis utrinque circiter 7, obscuris; inflorescentiis axillaribus, solitariis, circiter 2.5 cm longis, subumbellatim ramosis, floribus paucis, umbellatis; fructibus ovoideis vel subglobosis, circiter 6 mm diametro.

A small glabrous tree, about 4 m high, the branches and branchlets reddish-brown, terete. Leaves thickly coriaceous, elliptic, 5 to 10 cm long, 3 to 6.5 cm wide, the upper surface strongly shining, the lower of nearly the same color but dull, the base broadly rounded, the apex obtuse or more usually very shortly and broadly acuminate, the margins distinctly revolute; nerves obscure, about 7 on each side of the midrib, sometimes nearly obsolete, at other times evident, very obscurely anastomosing, the reticulations obsolete; petioles stout, 2 to 3 mm long. Inflorescence axillary, solitary, peduncled, about 2.5 cm long, glabrous, few-flowered, the peduncles bearing usually

three, short, umbellately arranged branches at its apex, the branches bearing the umbellately arranged flowers, the pedicels about 2 mm long. Fruit purple, ovoid or subglobose, about 6 mm in diameter.

LUZON, Province of Cagayan, Abulug, near the beach on sand-dunes, *For. Bur. 17105 Curran*, February, 1909, *For. Bur. 13055 Wood* (type), January, 1912.

A species well distinguished by its elliptic, thickly coriaceous leaves, which have their margins distinctly recurved.

EXCLUDED SPECIES

MEMECYLON MANILLANUM Naud. in Ann. Sci. Nat. III 18 (1852) 276; Miq. Fl. Ind. Bat. 1[1] (1855) 516; Walp. Ann. 4 (1857) 803.

The type of this species was *Cuming 2322*, from Malacca, not from the Philippines. It is a synonym of *M. caeruleum* Jack. *M. diversifolium* Presl, discussed above, is probably also referable here.

The following species were erroneously credited to the Philippines by F.-Villar.[9] The known range for each is given, but none of them are definitely known to occur in the Philippines.

MEMECYLON COSTATUM Miq. Malay Peninsula, Java, Sumatra, Borneo.
MEMECYLON ELEGANS Kurz. Andaman Islands.
MEMECYLON AMPLEXICAULE Roxb. Malay Peninsula, Penang.
MEMECYLON MACROPHYLLUM Thwaites. Ceylon.
MEMECYLON ACUMINATUM Smith. Malay Peninsula.
MEMECYLON GRANDE Retz. Ceylon and India; extending to the Malay Peninsula, as interpreted by Cogniaux.
MEMECYLON LAEVIGATUM Blume. Burma, Malay Peninsula, Borneo, Java, Sumatra, etc.
MEMECYLON CAERULEUM Jack. Tenasserim, Malay Peninsula.
MEMECYLON TERMINALE Dalz. India.

B. NEW SPECIES OF MEDINILLA

The genus *Medinilla* in the Philippines is remarkably developed in the number of species, and presents a very interesting group in the diversity of its forms, and in their geographic distribution. In the year 1905 I published an enumeration of the known Philippine species,[10] with a key to facilitate their determination. This treatment, however, is now entirely obsolete, for at that time but twenty-one species were known from the Archipelago, about one-half of which were proposed as new in the paper above mentioned.

As the botanical exploration of the Philippines has progressed, an enormous number of previously undescribed species have been discovered in most of the larger families of plants

[9] Novis. App. (1880) 189, 190.
[10] Govt. Lab. Publ. (Philip.) 29 (1905) 33–38.

that are found in the Archipelago. Collections have been made in most of the larger islands, and it has been very rare that any comprehensive collection received at the Bureau of Science has failed to present some new form or forms of *Medinilla*. While a few species of the genus are of wide Philippine distribution, such as *Medinilla myrtiformis* Triana, *M. ramiflora* Merr. (perhaps both best considered under the genus *Anplectrum*), and *M. astronioides* Triana, others are very local, and a very large number of species are known but from a single locality. Most species are found at medium and higher altitudes, and almost without exception in the forested regions. Very few species are found at low altitudes, and then only in those regions having a heavy and continuously distributed rainfall. Most of the species are terrestrial, but a number are found in the mossy forests as true or facultative epiphytes.

At the present time, including the forms considered below, about 100 species have been described from Philippine material, more than are known otherwise in the entire genus over its extended range from tropical eastern Africa, the Mascarene Islands, India, Malaya, the Marianne Islands, and Polynesia. The number of Philippine forms will certainly be considerably increased as exploration progresses, for at the present time there are several very distinct forms in the collections of the Bureau of Science, represented by imperfect material, which cannot be referred to any described species, while collections recently received present still additional apparently new forms which will be studied later.

With the exception of two or three species, it seems to be evident that practically all the Philippine forms are endemic, but in spite of the very high percentage of endemism, it is apparent that the Archipelago presents a center of distribution for the genus. The genus is not particularly highly developed in the Malay Peninsula (12 species), or in Java (18 species), and so far as the flora of Borneo is concerned (17 speoies) it apparently agrees with that of Java and of the Malay Peninsula in having comparatively few representatives of the genus. Comparatively speaking, however, the flora of Borneo is very imperfectly known, and the same is true of the islands to the south and southeast of the Philippines, so that any conclusions drawn from the present known range of Philippine species may later have to be radically revised when the neighboring islands are botanically more thoroughly explored. It is suspected, however, that Borneo will eventually yield a great many additional

species, and that still more will be discovered in the islands to the south of the Philippines. In an additional paper of this series it is hoped that later the entire genus, as to its Philippine representatives, can be considered, with detailed information as to the occurrence and range of the various species and with a key to all forms.

In the following paper the species have been roughly arranged according to the distinctive characters selected by Cogniaux for grouping the forms. All belong in the section *Eumedinilla*.

A. Entirely glabrous (species 1–19)

Inflorescence axillary (species 1–12)

Leaves whorled (species 1–6)

1. MEDINILLA DUODECANDRA sp. nov.

Frutex scandens glaber, ramis ramulisque teretibus; foliis verticillatis, ovato-ellipticis, usque ad 13 cm longis, petiolatis, brevissime apiculato-acuminatis, basi acutis vel acuminatis, 7-plinerviis, in siccitate submembranaceis vel chartaceis; cymis axillaribus, solitariis vel fasciculatis, brevibus, paucifloris; floribus 6-meris; staminibus 12, valde inaequalibus.

A scandent shrub reaching a height of 9 m, glabrous throughout. Branches and branchlets terete, light-gray or somewhat brownish. Leaves verticillate, 3 or 4 at each node, ovate-elliptic, 7 to 13 cm long, 4.5 to 6.5 cm wide, when dry somewhat shining, the upper surface darker in color than the lower, submembranaceous or chartaceous, apex very abruptly apiculate-acuminate, base acute or somewhat decurrent-acuminate, 7-plinerved, the two inner pairs of nerves more prominent than the outer pair and reaching to the apex of the leaf; petioles 1.5 to 2.5 cm long. Cymes axillary, solitary or several at each node, few-flowered, less than 4 cm in length, the bracts and bracteoles none or very early deciduous; pedicels up to 1 cm in length, slender. Calyx cup-shaped or broadly urceolate, truncate, about 4 mm long. Petals 6, pink, obliquely oblong-obovate, about 1.5 cm long, 9 mm wide. Stamens 12, in two rows, very unequal, the longer 6 about 23 mm in length, the shorter six 15 mm long; anthers of the longer stamens slender, the appendage produced about 2.5 mm below the cells, there with a slender dorsal spur about 2 mm long, slightly thickened at its apex, and with two anterior obtuse appendages less than 1 mm long; anthers of the short stamens stouter than those of the long ones, the connective not produced at the base, the dorsal spur slender, thickened at

the end, 2.5 mm long, the anterior appendages oblong, about 1.5 mm long.

MINDANAO, Butuan Subprovince, Mount Hilong-Hilong, *Weber 1010*, March 15, 1911 in forests, altitude about 150 m.

A species manifestly very closely allied to *Medinilla verticillata* Merr., differing chiefly in its 6-merous flowers. It is possible that a large series of specimens would show the form here described to be specifically identical with *M. verticillata*, with a range of floral organs from 4-merous to 6-merous, for Mr. Elmer's field notes state that in the type of the latter species about one-half of the flowers had 4 petals and 4-celled ovaries, and the other half 5 petals and 5-celled ovaries. I have, however, seen no 5-merous and 6-merous flowers on the same plant, and they may not occur. All the flowers examined on Weber's specimens were 6-merous. In habit, all vegetative characters, inflorescence, the unequal stamens and especially in the peculiar downward prolongation of the connectives of the long anthers, the two species are practically identical.

2. **MEDINILLA MEARNSII** sp. nov.

Frutex scandens, glaber, ramulis teretibus; foliis verticillatis, ut videtur ternis, ovatis, usque ad 15 cm longis, 5-plinerviis, breviter acuminatis, basi late rotundatis, petiolo 3 ad 4 cm longo; floribus 5-meris, axillaribus, breviter pedunculatis.

A scandent glabrous shrub, the branches and branchlets terete. Leaves verticillate, usually 3 at each node, sometimes 4, coriaceous, ovate, 12 to 15 cm long, 6 to 8 cm wide, shortly and abruptly acuminate, base broadly rounded, 5-plinerved, the two interior nerves very prominent, reaching the apex of the leaf, the outer pair much fainter, extending to about the middle of the leaf, the reticulations obsolete; petioles rather stout, 3 to 4 cm long. Inflorescence shortly peduncled, axillary, apparently having very few flowers, in the one observed the peduncle about 5 mm long. Mature buds ellipsoid, the calyx about 12 mm long, truncate. Petals 5.

MINDANAO, Province of Misamis, Mount Malindang, *For. Bur. 4685 Mearns & Hutchinson*, May 16, 1906, in forests, altitude about 1000 m.

A species manifestly allied to *Medinilla verticillata* Merr., differing especially in its leaves being broad and rounded at the base, not acute, with longer petioles, and its larger flowers.

3. **MEDINILLA ROLFEI** sp. nov.

Frutex glaber, ramis ramulisque teretibus, tenuibus; foliis verticillatis, quarternis, subcoriaceis, oblongo-ellipticis, acuminatis, basi acutis, petiolatis, usque ad 5 cm longis, triplinervis; inflorescentiis e axillis defoliatis, paucifloris, pedunculis ebracteolatis, 2 ad 3 cm longis; floribus 5-meris, petalis 15 mm longis.

A glabrous shrub, apparently erect, terrestrial. Branches and branchlets slender, terete. Leaves whorled, 4 at each node, subcoriaceous, oblong-elliptic, 3.5 to 5 cm long, dull when dry, of about the same color on both surfaces or the upper surface somewhat olivaceous, the lower brownish, base narrowed, acute, apex shortly acuminate; nerves 3, the lateral pair leaving the midrib about 2 mm above the base, continuing to the apex, reticulations obsolete; petioles 5 to 8 mm long. Inflorescence from the axils of fallen leaves, slender, few flowered, ebracteolate, the peduncles very slender, 2 to 2.5 cm long; pedicels 5 mm long. Flowers 5-merous. Calyx cup-shaped, truncate, minutely 5-denticulate, about 6 mm long. Petals 5, obliquely obovate, 15 mm long. Stamens 10, subequal; filaments 5.5 mm long; anthers lanceolate, somewhat curved, acuminate, 6 mm long, dorsal spur slender, curved, nearly 1 mm long, the anterior appendages stout, thickened, incurved, about 1.2 mm long.

NEGROS, Mount Silay, *Whitford 1500*, May, 1906, common on exposed ridges at an altitude of about 1100 m.

A species well characterized by its verticillate, small, 3-plinerved leaves, and comparatively large, 5-merous flowers. Dedicated to Mr. R. A. Rolfe of the Kew Herbarium who has done much work on the Philippine Flora.

4. MEDINILLA MIRANDAE sp. nov.

Frutex glaber, ut videtur erectus, ramis ramulisque teretibus; foliis verticillatis, quarternis, oblongo-ellipticis vel anguste oblongo-ovatis, usque ad 18 cm longis, 3-, rariter 5-plinerviis, basi acutis, apice breviter acuminatis; inflorescentiis lateralibus, brevibus, paucifloris, pedunculis haud 1 cm longis; fructibus ampulliformibus, 1.5 cm longis, truncatis, 5-locellatis.

A glabrous shrub, apparently erect, the branches and branchlets terete. Leaves verticillate, 4 at each node, chartaceous or subcoriaceous when dry, apparently much thicker when fresh, slightly shining, the lower surface a little paler than the upper, oblong-elliptic to narrowly oblong-obovate, 11 to 18 cm long, 4 to 7 cm wide, narrowed below to the acute base, the apex rather abruptly and shortly acuminate; nerves 1, rarely 2 pairs, prominent, leaving the midrib at from 1.5 to 3 cm above the base, anastomosing with the midrib below the apex, the additional outer pair, when present, much fainter, disappearing at about the middle of the leaf, reticulations none, or very indistinct; petioles 1 to 3 cm long. Inflorescence at the nodes on the branches below the leaves, the peduncles less than 1 cm long, bearing a few umbellately arranged flowers at the apex. Flowers not seen. Fruit more or less urceolate, pink, about 1.3

cm long, about 1 cm in diameter below the middle, the calyx-rim persistent, truncate, much produced above the fruit.

BASILAN, summit of Mount Calvario, *For. Bur. 18922 Miranda*, September, 1912.

A species very similar to *Medinilla curranii* Merr., and *M. subumbellata* Merr., differing from the former in its 5-celled, not 4-celled ovary, and from the latter in its larger, 5-celled, not 6-celled fruits, and larger leaves. From *Medinilla verticillata* Merr., another closely allied form, it differs in its 3-plinerved, not prominently 5-plinerved leaves, solitary, not fascicled inflorescences, and other characters. All four species are characterized by their more or less similar vegetative characters, and very short, few-flowered, lateral inflorescences.

5. MEDINILLA SUBUMBELLATA sp. nov.

Frutex scandens, epiphyticus, glaber; ramulis teretibus; foliis verticillatis, ternis vel quarternis, subcoriaceis, obovatis, basi angustatis, acutis, triplinerviis, apice obtusis, apiculatis vel brevissime acuminatis, petiolatis; inflorescentiis axillaribus, solitariis vel fasciculatis, circiter 2 cm longis, pedunculatis; fructibus ampulliformibus, circiter 1 cm longis, subumbellatim dispositis, 6-locellatis.

A scandent, epiphytic, glabrous shrub, the branches and branchlets terete. Leaves verticillate, usually 4, sometimes 3 at each node, obovate to oblong-obovate, coriaceous or subcoriaceous, rather pale when dry, slightly shining, 9 to 12 cm long, 4 to 6 cm wide, the apex broad and rounded and with a short apiculus or very shortly acuminate, base narrowed, acute; nerves 3, the lateral pair leaving the midrib about 1 cm above the base, nearly as prominent as the midrib and anastomosing with it at the apex, the reticulations obsolete; petioles about 1.5 cm long. Inflorescence solitary or fascicled in the axils of fallen leaves, the peduncles 1 cm long or less. Flowers unknown. Fruit fleshy, ampulliform, dark-red when mature, truncate, 8 to 10 mm long, 2 to 5 umbellately arranged at the apex of each peduncle, 6-celled.

MINDORO, Mount Halcon, *Merrill 5660*, November 10, 1906, in forests, altitude about 700 m.

A species manifestly allied to *Medinilla verticillata* Merr., and to *M. curranii* Merr., differing from both in its fewer-nerved leaves, and in its 6-celled fruits. *M. verticillata* has 5-merous flowers, while *M. curranii* has 4-merous ones.

6. MEDINILLA LATERALIS sp. nov.

Frutex epiphyticus glaber, ramulis anguste 4-alatis, nodis dense setosis; foliis ternis, oblongo-ellipticis, breviter petiolatis, circiter 20 cm longis, utrinque angustatis, basi acutis, apice

acute acuminatis, 7-plinerviis; paniculis axillaribus, longe pedunculatis, usque ad 40 cm longis; floribus 4-meris.

An epiphytic glabrous shrub, the branchlets 4 to 5 mm thick, somewhat 4-angled, narrowly 4-winged, the nodes very densely setose. Leaves opposite, oblong-elliptic, about 20 cm long, 8 to 9 cm wide, coriaceous, somewhat shining when dry, of the same color on both surfaces or the upper surface paler, narrowed at both ends, base acute, apex shortly and sharply acuminate; midrib very prominent at the base, the nerves 7, as prominent as the upper part of the midrib, the inner pair leaving the midrib 2.5 to 3 cm above the base and reaching the apex of the leaf, the next outer pair leaving the midrib about 1.5 cm below the upper pair, reaching about three-fourths to the apex, there becoming obsolete or very faint, the outer pair fainter, not reaching beyond the middle of the leaf, reticulations obsolete; petioles stout, about 8 mm long. Inflorescence lateral, from the axils of fallen leaves, solitary, pendulous, the peduncle about 20 cm long, the panicle proper about as long as the peduncle, the branches verticillate, about 4-nate, the lower ones 10 cm long or less, verticils distant, the branches of the panicle subtended by ovate, acuminate, 7 to 8 mm long bracts. Flowers pink, 4-merous. Calyx urceolate, truncate, about 6 mm long, the limb produced above the ovary, marked on the outside by 4 minute projections corresponding to teeth. Petals obliquely obovate, 13 mm long. Stamens 8, equal; filaments 6 mm long; anthers lanceolate, acuminate, 7 mm long, the dorsal appendage slender, 0.5 mm long, the anterior ones ovoid, stout, blunt, about 1.4 mm long.

MINDANAO, District of Zamboanga, Sax River Mountains back of San Ramon, *Merrill 8292*, November 28, 1911, epiphytic, in forests, altitude about 1,100 m.

A species well characterized by its ternate leaves, narrowly winged branchlets, and lateral, very long-peduncled panicles. It has no close allies among the Philippine species with verticillate leaves and lateral inflorescence.

LEAVES OPPOSITE (SPECIES 7–12)

7. MEDINILLA CAMIGUINENSIS sp. nov.

Frutex ut videtur scandens *M. vanoverberghii* affinis, differt nodis haud setoso-barbatis, foliis sessilibus, apice breviter abrupteque acuminatis vix rotundatis, basi 7-plinerviis.

Apparently a scandent shrub, glabrous throughout. Branches terete, light-gray, about 6 mm in diameter, the nodes glabrous. Leaves opposite, chartaceous, sessile, broadly elliptic to

elliptic-ovate, 10 to 23 cm long, 8 to 14 cm wide, shining and of about the same color on both surfaces when dry, the base broadly rounded, the apex shortly and abruptly acuminate; base 7-plinerved, the outermost pair more slender than the inner ones, reaching to the middle or above, the inner two pairs reaching the apex of the leaf, the innermost pair leaving the midrib 2 to 2.5 cm above the base, the reticulations or cross-veinlets few, very distant, or obsolete. Panicles axillary, solitary, pendulous, up to 50 cm in length, the branches whorled, the lower ones up to 14 cm long, the whorls few, distant. Flowers 4-merous, pink, subumbellately arranged on the ultimate branchlets, few, their pedicels slender, 8 to 10 mm long, the bracts none or small and very early deciduous. Calyx cup-shaped, truncate, 4 mm long. Petals obliquely obovate, 8 mm long. Stamens 8, subequal, their filaments 4.5 mm long, the anthers lanceolate, acuminate, as long as the filaments, the posterior basal appendage less than 0.5 mm long, the anterior two short, stout, curved. Fruit purple, fleshy, about 8 mm in diameter.

CAMIGUIN DE MINDANAO, on damp slopes in forests, old volcano, *Bur. Sci. 14639 Ramos*, March 29, 1912.

A species manifestly allied to *Medinilla vanoverberghii* Merr., of Luzon, distinguished by the characters given in the diagnosis.

8. **MEDINILLA SESSILIFOLIA** sp. nov.

Frutex epiphyticus glaber, ramulis ut videtur carnosis, in siccitate plus minusve compressis; foliis oppositis, sessilibus, in siccitate membranaceis, obovatis ad obovato-ellipticis, usque ad 20 cm longis, apice brevissime acuminatis, basi angustatis, obtusis, 3-plinerviis, reticulis distinctis, laxissimis; inflorescentiis brevibus, paucifloris, e ramis defoliatis; fructibus succulentis, 4-locellatis, ovoideis, truncatis, circiter 8 mm diametro.

An epiphytic glabrous shrub, apparently scandent, the branches stout, emitting numerous short roots, the branchlets apparently succulent when fresh, more or less compressed and about 6 mm wide when dry. Leaves opposite, sessile, obovate to obovate-elliptic, 11 to 20 cm long, 6 to 12 cm wide, when fresh apparently coriaceous, when dry thinly membranaceous, shining, of the same color on both surfaces, the apex abruptly and shortly acuminate to nearly rounded, the base narrowed, obtuse, 3-plinerved, the lateral nerves stout, prominent, leaving the very stout midrib 1 to 2 cm above the base and extending to the apex, the reticulations distinct, very lax. Flowers not seen, the inflorescences numerous, scattered along the branches below the

leaves, few-flowered, usually fascicled, about 1 cm long, apparently ebracteate. Fruit red, very soft and fleshy, when dry about 8 mm long, ovoid, truncate, 4-celled.

BASILAN, Cumalarang, *Bur. Sci. 16145 Reillo,* August 22, 1912, in forests.

A very characteristic species, at once distinguishable by its sessile leaves, a character very unusual in the genus.

9. **MEDINILLA WEBERI** sp. nov.

Frutex erectus, glaber, circiter 1 m altus; ramulis gracilibus, teretibus; foliis oppositis, subsessilibus, usque ad 12 cm longis, oblongo-ovatis, valde acuminatis, margine superne distanter denticulatis, basi cordatis, 5-plinerviis, nervis exterioribus tenuibus; floribus 4-meris, axillaribus et in axillis defoliatis, in cymis abbreviatis congestis dispositis.

An erect glabrous shrub about 1 m high. Branches slender, terete, usually with thin, reddish-brown, somewhat papery and flaky bark. Leaves opposite, subsessile, 8 to 12 cm long, 3 to 5 cm wide, subcoriaceous, dull when dry, of about the same color on both surfaces, the base rounded and somewhat cordate, the apex narrowly subcaudate-acuminate, the acumen blunt, the margins, especially above the middle, with distant, small, subglandular teeth; nerves 5, leaving the midrib just above the base, the inner pair prominent, reaching the apex of the leaf, the outer pair faint, sometimes nearly wanting, not reaching above the middle of the leaf; petiole stout, 2 mm long or less. Cymes axillary and in the axils of fallen leaves, usually solitary, few-flowered, congested, short, less than 1 cm long; bracts narrowly lanceolate, acuminate, 3 mm long; bracteoles similar but only 2 mm long. Flowers unknown. Berry globose or ovoid, red, about 5 mm in diameter, 4-celled, the calyx-limb slightly produced, 4-toothed, the teeth narrowly lanceolate, sharply acuminate, 1 to 1.2 mm long.

MINDANAO, Butuan Subprovince, Mount Hilong-Hilong, *Weber 1009,* March 28, 1911, growing in rocky soil in forests, altitude about 400 m.

A species similar and allied to *Medinilla cardiophylla* Merr., *M. ramiflora* Merr., and *M. myrtiformis* Triana, but distinguished from all by its congested, very short cymes.

10. **MEDINILLA PINNATINERVIA** sp. nov.

Frutex ut videtur scandens, ramulis longissime ciliato-setosis exceptis glaber; foliis oblongis ad oblongo-ellipticis, chartaceis vel subcoriaceis, oppositis, in paribus subaequalibus, acutis vel acuminatis, basi acutis, petiolatis, usque ad 25 cm longis, penninerviis, nervis utrinque 4, prominentibus, distantibus, curvato-

adcendentibus, nervis secundariis prominentibus, laxis, subparallelis; inflorescentiis caulifloris, racemosis, racemis solitariis vel fasciculatis, pedicellis tenuibus, elongatis, articulatis, minutissime bibracteolatis; floribus 4-meris, calycibus truncatis.

Apparently a scandent shrub, glabrous except for the long ciliate-setose hairs on the branchlets, and occasionally a very few on the petioles and the lower surface of the leaves, these hairs brownish, 3 to 4 mm long. Branches terete, rather slender, brownish. Leaves opposite, those of each pair subequal, oblong to oblong-elliptic, chartaceous to subcoriaceous, shining, of about the same color on both surfaces when dry or somewhat brownish beneath, 20 to 25 cm long, 7 to 9 cm wide, apex acuminate or sharply acute, base acute, sometimes a little inequilateral; nerves 4 pairs, leaving the midrib below the middle, pinnately arranged, curved-ascending, the upper pair reaching the apex of the leaf, the reticulations or secondary nerves lax, prominent, subparallel; petioles about 3 cm long. Inflorescence from the stems below the leaves, of many-flowered, short, rather dense, solitary or fascicled racemes 5 cm long or less, the pedicels slender, reddish, ascending, persistent, numerous, about 2 cm long, jointed at about the middle, there with a pair of minute bracteoles. Flowers unknown. Fruit red or purplish, fleshy, somewhat urceolate, about 8 mm long, the fruit proper globose or globose-ovoid, glabrous, the calyx-limb produced, about 3 mm long, truncate, the teeth represented by 4 slender ridges on the outside.

LUZON, Province of Cagayan, Abulug River, on a fallen tree, in forest, *Bur. Sci. 13998 Ramos*, February, 1912; Pamplona, *Bur. Sci. 7483 Ramos*, March, 1909, in forests.

A very characteristic species apparently allied to *Medinilla loheri* Merr., and to *M. disparifolia* C. B. Rob., well characterized by its cauline, racemose inflorescence, the pedicels very slender, straight, stiff, and jointed in the middle, as well as by its pinnately veined leaves. Possibly not a species of the genus, which can only be determined by an examination of the flowers, the latter being at present unknown.

11. MEDINILLA GRACILIPES sp. nov.

Frutex glaber, ramulis teretibus, nodis vix setosis; foliis oppositis, lanceolatis vel oblongo-lanceolatis, petiolatis, acuminatis, usque ad 10 cm longis, basi triplinerviis; inflorescentiis e axillis defoliatis, pendulis, pedunculis gracilibus, 15 cm longis, paniculis laxis, ramis verticillatis; fructibus ut videtur 4-locellatis.

A glabrous shrub, erect or scandent, the branches and branchlets slender, terete, the ultimate ones 1.5 mm in diameter or less, the nodes not setose. Leaves opposite, lanceolate or oblong-

lanceolate, rather pale, of about the same color on both surfaces and slightly shining when dry, 7 to 10 cm long, 2 to 3 cm wide, base acute, apex rather slenderly acuminate; nerves 3, leaving the midrib about 5 mm above the base, extending to the apex, distinct, the lateral ones as prominent as the midrib, the reticulations obsolete; petioles 1 to 1.5 cm long. Inflorescence solitary, from the axils of fallen leaves on the branches, pendulous, the peduncle slender, up to 15 cm in length, the panicle proper (in fruit) lax, 15 cm long, the branches verticillate, spreading, about 3 at each node, the lower ones about 2 cm long and again branched, the verticils distant; bracts linear-lanceolate, about 2 mm long. Flowers unknown. Fruit ovoid, truncate, 5 to 6 mm long, apparently 4-celled, the pedicels 1 to 1.5 cm long.

LUZON, Province of Rizal, Angilog, *Loher 6275*, March, 1906.

A very characteristic species, especially distinguished by its oblong to lanceolate, acuminate, petioled, 3-plinerved leaves, and its lateral, very long peduncled infructescence.

12. **MEDINILLA MEGACARPA** sp. nov.

Frutex epiphyticus, scandens (?), glaber, ramis ramulisque teretibus; foliis oppositis, petiolatis, coriaceis, ovatis ad elliptico-ovatis, usque ad 10 cm longis, in siccitate supra viridibus, subtus brunneis, apice subrotundatis, basi rotundatis, 5-plinerviis; inflorescentiis lateralibus, e axillis defoliatis, ut videtur paucifloris, brevibus; fructibus circiter 1.5 cm longis, truncatis, 5-locellatis.

An epiphytic shrub, probably scandent, glabrous, the branches and branchlets terete. Leaves opposite, ovate to elliptic-ovate, coriaceous, brittle when dry, 7 to 10 cm long, 4 to 6 cm wide, when dry the lower surface dark-brown, the upper surface green, slightly shining, apex somewhat rounded, base rounded, 5-plinerved, both pairs of lateral nerves reaching the apex of the leaf, nearly as prominent as the midrib, the outer pair leaving the midrib near the base, the inner pair at from 1 to 1.5 cm above the base, the transverse reticulations indistinct; petioles 2 to 3 cm long. Inflorescence axillary, in the axils of fallen leaves, short, few-flowered. Flowers unknown. Fruit solitary, the peduncle 1 cm long or less, ovoid or cup-shaped, truncate, nearly 1.5 cm long, 5-celled.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 10977 Ramos*, August, 1911, in forests.

A species well characterized by its large fruits and by its leaves being green above and dark-brown beneath when dry; allied to *Medinilla coriacea* Merr., but very different from that species.

INFLORESCENCE TERMINAL (SPECIES 13–19)

FLOWERS 5-MEROUS (SPECIES 13, 14)

13. MEDINILLA COMPRESSICAULIS sp. nov.

Frutex epiphyticus glaber, circiter 3 m altus, ramis ramulisque crassis, compressis, 4-alatis; foliis oppositis, sessilibus, anguste ovatis vel late oblongo-ovatis, coriaceis, acutis, basi rotundatis, 5-plinerviis; inflorescentiis terminalibus, paniculatis, pedunculatis, usque ad 25 cm longis, multifloris, bracteis ovatis, vix 1 cm longis; floribus 5-meris.

An epiphytic glabrous shrub about 3 m high, the nodes setose with short densely disposed processes, the branches gray, stout, very strongly compressed, 4-winged, the branchlets also stout, compressed, about 1 cm wide, their wings more prominent, about 3 mm wide. Leaves opposite, sessile, narrowly ovate to broadly oblong-ovate, coriaceous, base rounded, apex acute, 20 to 25 cm long, 8 to 12 cm wide, 5-plinerved, the midrib and nerves prominent, the inner pair of nerves reaching the apex, the outer pair extending to the middle, or beyond as very faint submarginal nerves, sometimes a faint additional outer pair of nerves being present, reticulations lax, not prominent, sometimes obsolete. Inflorescence terminal, paniculate, all parts red, the peduncles 6 to 12 cm long, the flower-bearing portion about as long, branches whorled, the bracts ovate, 1 cm long or less, deciduous. Flowers red, 5-merous, their pedicels about 4 mm long. Calyx cup-shaped, about 4.5 mm long and wide, truncate. Petals 5, obliquely obovate, about 9 mm long. Stamens 10, equal, their filaments slender, 4 mm long; anthers 2.2 mm long, dorsal spur of the connective very short. Fruit subglobose, fleshy, purple when mature, 7 to 8 mm in diameter.

LUZON, Benguet Subprovince, about 35 kilometers north of Baguio, *Merrill 7687*, May, 1907 (type), altitude about 1,800 m, growing on trees in ravines: Lepanto Subprovince, trail to Balbalasan, *For. Bur. 5739 Klemme*, November 19, 1906, altitude 1,500 m.

A very characteristic species, distinguishable from the others in the genus by its very prominently compressed and 4-winged branches, its sessile, 5-plinerved, ample, opposite leaves, and its red, not pink, inflorescence and flowers, the latter 5-merous.

14. MEDINILLA ACUMINATA sp. nov.

Frutex erectus glaber, ramulis teretibus, nodis vix setosis; foliis oppositis, oblongo-ovatis, utrinque angustatis, petiolatis, usque ad 12 cm longis, acuminatis, basi 5-plinerviis, nervis interioribus subalternis, reticulis obsoletis; inflorescentiis ter-

minalibus, paniculatis, ut videtur paucifloris, quam folia brevioribus; **fructibus 5- rariter 6-locellatis.**

An erect glabrous shrub, the branches and branchlets slender, terete, light gray, the ultimate ones 2 mm in diameter or less. Leaves opposite, oblong-ovate, narrowed at both ends, base acute, apex rather prominently acuminate, 7 to 12 cm long, 2.5 to 5 cm wide, brown and of about the same color on both surfaces when dry, somewhat shining; nerves 5, distinct, the two lateral pairs leaving the midrib above the base, as prominent as the midrib, reaching the apex, the lower pair opposite, the inner or upper pair subalternate, reticulations obsolete; petioles slender, 1 to 1.5 cm long. Inflorescence terminal, paniculate, shorter than the leaves, apparently few-flowered. Flowers unknown. Panicles in fruit about 6 cm long, the branches opposite or ternate, about 1 cm long. Fruit red, cup-shaped, about 6 mm long, truncate, with 5, rarely 6 very minute teeth, 5- rarely 6-celled.

MINDORO, Mount Halcon, *Merrill 5667*, in forests, altitude about 1,800 m, November 18, 1906.

Apparently closely allied to *Medinilla calelanensis* Elm., but differing in its leaves, venation, and infructescence, and in its glabrous, not setose nodes.

FLOWERS 4-MEROUS (SPECIES 15–19)

15. MEDINILLA CANLAONENSIS sp. nov.

Frutex glaber, erectus, circiter 3 m altus, ramulis teretibus, nodis glabris vel leviter setosis; foliis petiolatis, oppositis, coriaceis, oblongo-ellipticis, utrinque angustatis, basi acutis, 5- vel 7-plinerviis, apice acuminatis, usque ad 18 cm longis; inflorescentiis terminalibus, paniculatis, 14 ad 18 cm longis; floribus 4-meris.

A glabrous erect shrub about 3 m high, the branches and branchlets terete, the ultimate ones 3 to 4 mm in diameter, nodes glabrous or slightly setose. Leaves oblong-elliptic, 12 to 18 cm long, 5 to 6.5 cm wide, coriaceous, of about the same color on both surfaces when dry, dull or slightly shining, subequally narrowed at both ends, base acute, apex shortly and sharply acuminate; nerves 5 or 7, leaving the midrib above the base, the inner two pairs as prominent as the upper part of the midrib, reaching the apex of the leaf, the third pair, when present, more slender and scarcely reaching the middle of the leaf, the inner pair leaving the midrib 1.5 to 2 cm above the base, reticulations obsolete; petioles about 5 mm long. Panicles terminal, about as long as the leaves, peduncled, the branches whorled, the lower ones 5 cm long, verticils distant. Flowers pink, 4-merous, their pediceis about 5 mm long, the bracts and

bracteoles minute, linear, 1 to 2 mm long. Calyx urceolate, truncate, about 5 mm long. Petals 4, obliquely obovate, about 13 mm long. Stamens 8, equal; filaments 5.5 mm long; anthers lanceolate, acuminate, 5.5 mm long, the dorsal appendage slender, 0.8 mm long, the anterior appendages stout, curved, blunt, 1 mm long. Fruit broadly urceolate or cup-shaped, about 8 mm long.

NEGROS, Canlaon Volcano, *Merrill 6882*, April, 1910, in forests, altitude about 1,600 m.

Apparently most closely allied to *Medinilla subsessilis* Merr., of Luzon, differing in its more numerously nerved leaves, longer petioles, nearly glabrous nodes, and much smaller bracts. It resembles *Medinilla negrosensis* Merr., *M. confusa* Merr., and *M. myriantha* Merr., but differs from all, among other characters, by its much larger flowers.

16. MEDINILLA NEGROSENSIS sp. nov.

Frutex glaber, ramis ramulisque 3- vel 4-angulatis, nodis dense setosis; foliis oppositis, breviter petiolatis, ovatis ad elliptico-oblongis, usque ad 20 cm longis, basi acutis vel rotundatis, 7- vel 9-plinerviis, apice distincte acuminatis; paniculis terminalibus, foliis subaequilongis vel longioribus, diffusis, multifloris, ramis verticillatis; floribus 4-meris.

A shrub, erect or scandent, glabrous, the branches and branchlets distinctly 3- or 4-angled, the nodes rather densely setose. Leaves opposite, ovate to elliptic-oblong, coriaceous, somewhat shining, of about the same color on both surfaces when dry, 12 to 20 cm long, 4.5 to 9 cm wide, the base rounded or acute, the apex distinctly and rather slenderly acuminate; nerves 7 to 9, as prominent as the midrib, all leaving the midrib above the base, the inner pair at from 1.5 to 3 cm above the base, the inner two pairs reaching the apex of the leaf, reticulations obsolete; petioles 6 to 10 mm long. Panicles terminal, as long as or longer than the leaves, peduncled, flower-bearing in the upper part, the branches verticillate, 5 to 8 at each node, spreading, the lower ones up to 7 cm in length, many-flowered, the verticils distant. Flowers 4-merous, ebracteolate, or bracteoles very minute and deciduous, the pedicels 3 to 8 mm long. Calyx broadly urceolate or urceolate-campanulate, about 3 mm long, truncate. Petals 4, obliquely obovate, 7 mm long. Stamens 8, equal; filaments about 3.5 mm long; anthers lanceolate, 4 mm long, acuminate, dorsal spur slender, 0.5 mm long, the anterior appendages stout, curved, obtuse, 1 mm long.

NEGROS, Cuernos Mountains, *Elmer 10049*, May, 1908, distributed as *Medinilla intermedia* Blume.

Among the known Philippine species most closely allied to *Medinilla confusa* Merr., but distinguished at once by its angled branches and branchlets, its densely setose nodes, and its petioled leaves; from *Medinilla intermedia* Bl., it differs in its angled stems, and petioled, acuminate, more numerously nerved leaves.

17. MEDINILLA BREVIPES sp. nov.

Frutex glaber, scandens, ramulis teretibus, nodis vix setosis; foliis oppositis, ellipticis ad late oblongo-ellipticis, usque ad 15 cm longis, basi late rotundatis, distincte cordatis, brevissime petiolatis, tenuiter 7-plinerviis, apice brevissime abrupte acuminatis; inflorescentiis terminalibus, paniculatis, floribus 4-meris.

A glabrous shrub, scandent according to the field notes, the branches and branchlets terete, striate when dry, nodes not at all setose. Leaves opposite, coriaceous, elliptic to broadly oblong-elliptic, somewhat shining when dry, lower surface a little paler than the upper one, 10 to 15 cm long, 7 to 8 cm wide, base broadly rounded, distinctly cordate, apex very abruptly, broadly, and shortly acuminate; nerves usually 7, sometimes 5, the midrib very broad and prominent, the lateral nerves leaving the midrib just above the base of the leaf, the interior pair rather distinct at the base, becoming slender and indistinct above but reaching the apex, the next outer pair slender, not prominent, becoming obsolete above or reaching the apex, the outermost pair (when present) indistinct, not reaching beyond the middle of the leaf, or if so, then very indistinct, the reticulations obsolete; petioles very stout, 2 to 3 mm long, 5 to 6 mm wide. Panicle terminal, 15 to 20 cm long, the peduncle about one-half as long as the flower-bearing part, the branches whorled, 4-nate, 5 to 6 cm long, the whorls distant; bracts lanceolate, 5 mm long or less. Flowers pink, 4-merous, their pedicels about 4 mm long. Calyx cup-shaped, about 3 mm long, truncate. Petals 4, obliquely obovate, 5 mm long. Stamens 8, equal; filaments 3 mm long; anthers lanceolate, acuminate, 3 mm long, base somewhat sagittate by the spreading anterior appendages, the dorsal spur very minute. Fruit cup-shaped or ovoid, truncate, 4 to 5 mm in diameter.

LUZON, Province of Tayabas, Quinatacutan River, *Bur. 13179 Foxworthy & Ramos*, March, 1911, on fallen trees in forests, altitude about 100 mm.

A species well characterized by its elliptic leaves which are broadly rounded and distinctly cordate at the base, the faint nerves and the reticulations obsolete, and by its very short stout petioles. It is manifestly allied to *Medinilla ovalis* Merr., being at once distinguished by its larger leaves and its very short stout petioles.

18. MEDINILLA EPIPHYTICA sp. nov.

Frutex epiphyticus, paniculis leviter furfuraceis exceptis glaber; ramis subteretibus, nodis vix barbatis; foliis oppositis, petiolatis, oblongo-ovatis vel elliptico-ovatis, usque ad 8 cm longis, breviter acuminatis, basi subrotundatis, obscure 3- vel obscurissime 5-plinerviis, reticulis obsoletis; paniculis terminalibus, ad 10 cm longis, pedunculatis, bracteis parvis; floribus 4-meris.

An epiphytic shrub, quite glabrous except the slightly furfuraceous inflorescence. Branches terete or subterete, grayish or brownish, smooth, apparently somewhat fleshy when fresh, the nodes not bearded. Leaves opposite, oblong-ovate to elliptic-ovate, coriaceous, 4 to 8 cm long, 2.5 to 4.5 cm wide, slightly shining when dry, the upper surface pale-grayish, the lower one somewhat brownish, apex shortly acuminate, base rounded or obtuse; nerves 1 or sometimes 2 pairs, leaving the midrib just above the base, obscure, the secondary veins and reticulations obsolete; petioles 1 to 1.5 cm long. Panicles terminal, peduncled, including the peduncle up to 10 cm long, the branches opposite or somewhat whorled, the lower ones 2.5 cm long, all parts minutely brown-furfuraceous with minute small scales; bracts lanceolate, acuminate, about 5 mm long. Flowers not seen. Fruit globose or ovoid, fleshy, pink or red, about 5 mm in diameter, 4-celled.

LUZON, Province of Laguna, Dahican River back of San Antonio, *Bur. Sci. 15002 Ramos*, June, 1912, on trees in forests.

A species allied to *Medinilla mindorensis* Merr., differing in its less prominently nerved leaves, small bracts, and distinctly furfuraceous inflorescence. In the latter respect it resembles *M. ovalis* Merr., but that species has entirely differently shaped leaves.

19. MEDINILLA CONFUSA sp. nov.

Medinilla intermedia Merr. in Govt. Lab. Publ. (Philip.) 29 (1905) 37, Philip. Journ. Sci. 1 (1906) Suppl. 107, non Blume.

Frutex glaber, 3 ad 5 m altus; ramis teretibus; nodis non setosis; foliis sessilibus, oppositis, oblongo-ellipticis vel ovatis, breviter acuminatis, 5- vel 7-plinerviis, usque ad 16 cm longis; paniculis terminalibus, quam folia longioribus, diffusis, ramis verticillatis; floribus 4-meris.

A glabrous, somewhat spreading shrub, 3 to 5 m high. Branches terete, the nodes not setose. Leaves opposite, sessile, oblong-elliptic to ovate, subcoriaceous, somewhat shining, usually rather pale when dry, 10 to 16 cm long, 4 to 9 cm wide, base rounded or subacute, apex shortly acuminate; nerves two pairs, often with an additional outer and somewhat fainter pair, leaving

the midrib shortly above the base, the additional outer pair, when present, not reaching to the apex of the leaf, the transverse reticulations usually visible in dried specimens. Panicles terminal, usually about 20 cm long, diffuse, the branches verticillately arranged, in whorls of 4 or more, often nearly 10 cm in length, the secondary branches also verticillate, the bracts and bracteoles setaceous, small, deciduous. Flowers pink, 4-merous. Calyx urceolate-campanulate, truncate, 3 to 4 mm long. Petals obliquely obovate, about 9 mm long, 7 mm wide. Stamens subequal; filaments 4 mm long; anthers narrowly lanceolate, somewhat curved, 5 mm long, the posterior spur 0.7 mm long, the anterior auricles about 1 mm long. Fruit ovoid, fleshy, purple, about 6 mm in diameter.

LUZON, Province of Bataan, Mount Mariveles, on exposed ridges, altitude 900 to 1,000 m, *Merrill 3965, Elmer s. n., Williams 648, Whitford 125, Lyon s. n.* (type), *Bur. Sci. 6209 Robinson, Bur. Sci. 1663 Foxworthy, For. Bur. 2405 Meyer.*

A species previously identified with *Medinilla intermedia* Blume, but apparently sufficiently distinct from that form, recognized at once by its nodes being glabrous, nôt setose, differing also in several other characters, so far as can be determined from a comparison with the description of Blume's species. It is manifestly allied to *Medinilla myriantha* Merr., and *M. subsessilis* Merr., but both of these species have setose nodes.

B. PLANTS MORE OR LESS PUBESCENT, SETOSE, STELLATE-TOMENTOSE, OR AT LEAST FURFURACEOUS, NOT ENTIRELY GLABROUS (SPECIES 20–28)

20. MEDINILLA PARVA sp. nov.

Suffrutex erectus vix 40 cm altus, foliis junioribus ramulis inflorescentiisque plus minusve stellato-furfuraceis, ramulis teretibus; foliis oppositis, petiolatis, oblongo-ovatis, usque ad 10 cm longis, acuminatis, basi acutis, 5-plinerviis; cymis terminalibus, erectis, brevibus, paucifloris, bracteis elliptico-oblongis, usque ad 18 mm longis; floribus 5-meris.

An undershrub 40 cm high or less, the branches few, terete, glabrous, the branchlets slender, densely covered with brown, stellate-furfuraceous indumentum. Leaves opposite, oblong-ovate, subcoriaceous, 5 to 10 cm long, 2 to 4 cm wide, rather slenderly acuminate, base acute, the upper surface glabrous or nearly so, the lower surface brown-stellate-furfuraceous on the nerves; nerves usually two pairs, the inner pair leaving the midrib 8 to 10 mm above the base, prominent, reaching the apex, the outer pair much more slender, reaching the middle of the leaf, or extending beyond the middle as very faint submarginal nerves, the reticulations obsolete; petioles densely stellate-

furfuraceous, 1 to 1.5 cm long. Cymes terminal, furfuraceous-stellate with brown hairs, erect, shortly peduncled, few-flowered, 3 cm long or less, the pedicels about 3 mm in length. Bracts and bracteoles elliptic-oblong, narrowed and more or less acuminate at both ends, stellate-pubescent, 5-nerved, dark-red, persistent, up to 18 mm long, 8 to 9 mm wide. Calyx in fruit stellate-furfuraceous, nearly 1 cm long, urceolate, the limb extended about 4 mm above the fruit, 5-lobed, the lobes or teeth ovate, acute or obtuse, about 3 mm long, dark-red.

LUZON, Province of Tayabas, Infanta, Mount Binuang, *Bur. Sci. 9398 Robinson*, August 28, 1909, in the mossy forest, altitude about 960 m.

A species allied to *Medinilla luzonensis* Hook. f., differing in its fewer-nerved leaves, longer petioles, erect inflorescence, much larger and differently shaped bracts, and in many other characters.

21. **MEDINILLA CALCICOLA** sp. nov.

Frutex circiter 1 m altus, ramulis petiolis subtus foliis inflorescentiisque dense stellato-tomentosis; foliis oppositis, in paribus subaequalibus, coriaceis, acute acuminatis, basi acutis pinnatim 3-plinerviis, oblongis vel anguste oblongo-ellipticis, usque ad 18 cm longis; inflorescentiis lateralibus, brevibus, paucifloris, bracteis prominentibus rubro-purpureis instructis; floribus 5-meris, calycibus prominente 5-dentatis.

A shrub about 1 m high. Branches terete, glabrous, pale-gray, the branchlets very densely stellate-tomentose, the indumentum pale, plumose. Leaves opposite, those of each pair equal or subequal, oblong to narrowly elliptic-oblong, subequally narrowed at both ends, the apex acuminate, usually sharply so, the base acute, 10 to 18 cm long, 3 to 6.5 cm wide, the upper surface pale, shining, glabrous, the lower one very densely stellate-tomentose, the veins stellate-plumose, the indumentum pale-brownish; nerves two pairs, the outer pair subbasal, extending nearly or quite to the apex of the leaf, sometimes with a very short, additional outermost pair, the inner pair leaving the midrib from 2 to 6 cm above the base, reaching the apex, there anastomosing with the midrib; reticulations faint, obsolete or nearly so; petioles densely stellate-plumose-tomentose, stout, 1.3 to 2 cm long. Inflorescence axillary, about as long as the petioles, stellate-tomentose, the indumentum plumose, pale-brownish. Bracts reddish-purple, prominent, broadly ovate, obtuse, stellate-tomentose on both surfaces, about 15 mm long. Flowers 5-merous. Calyx stellate-tomentose, depressed-globose about 5 mm in diameter, the limb produced about 3 mm, divided half-way into five, broad, rounded or truncate teeth. Petals obliquely

oblong-obovate, about 10 mm long, glabrous. Stamens 10; filaments 5 mm long; anthers stout, oblong-lanceolate, curved, acuminate, about 4 mm long, the base truncate, about 1.5 mm wide, the posterior appendage very short, the anterior ones stout. Fruit subglobose, 6 to 7 mm in diameter, densely pale stellate-tomentose, crowned by the toothed calyx-rim.

LUZON, Province of Cagayan, Abulug River, *Weber 1574*, January 29, 1912, in crevices of limestone ledges, about 45 m above sea level.

A species manifestly very closely allied to *Medinilla halconensis* Merr., differing in its larger, differently shaped leaves which are in equal or subequal pairs, not very unequal as in that species, its shorter inflorescence, with red, not white bracts, and other minor characters.

22. MEDINILLA FURFURACEA sp. nov.

Frutex scandens, ramulis foliis subtus ad nervos inflorescentiisque minute brunneo-furfuraceis; ramis teretibus; foliis verticillatis, oblongo-ovatis, 7- vel 9-plinerviis, basi leviter cordatis, apice abrupte apiculato-acuminatis; inflorescentiis lateralibus, 10 ad 15 cm longis; floribus 5-meris.

A scandent shrub, the younger branches and branchlets, petioles, lower surface of the leaves on the nerves, and the inflorescence rather densely but minutely furfuraceous, the indumentum dark-brown. Branches terete, grayish, nearly 1 cm in diameter, with scattered, very prominent lenticels, the younger branchlets brown. Leaves verticillate, 4 or 5 at each node, membranaceous to chartaceous, shining, the upper surface glabrous, the lower a little paler when dry, with few scales scattered over the surface in addition to the numerous ones on the nerves, oblong-ovate, 15 to 20 cm long, 7 to 9 cm wide, the base somewhat cordate, the apex abruptly apiculate-acuminate; nerves 3 or 4 pairs, leaving the midrib in the lower 3 to 4 cm, prominent, only the innermost pair reaching the apex, the transverse nervules rather distant, distinct; petioles unequal in length, 3 to 5 cm long from the same node. Inflorescence lateral, on the branches below the leaves, 10 to 15 cm long, peduncled, minutely and densely dark brown-furfuraceous, the branches whorled, the primary ones about 3 cm long, each bearing a number of umbellately disposed white flowers, their pedicels about 1.5 cm long. Calyx cup-shaped, minutely furfuraceous, 10 mm long, truncate. Petals 5, about 2.3 cm long, narrowly oblong-obovate, obtuse, minutely furfuraceous externally. Stamens 10, very unequal; filaments of the longer stamens 12 mm, of the shorter ones 9 mm; longer anthers linear-lanceolate, acuminate, about 1.5 cm long,

the basal dorsal appendage 1.5 mm long, the two anterior ones 2.2 mm long; shorter anthers lanceolate, acuminate, 10 mm long, the dorsal appendage narrowly oblong, obtuse, 2 mm long, the anterior two about 3 mm long. Ovary 5-celled.

LEYTE, Dagami, *Bur. Sci. 15224 Ramos*, August 6, 1912, climbing on trees in forests, flowers said to be white.

A strongly marked species, distinguishable by its minute, dark-brown, furfuraceous indumentum, its verticillate, slightly cordate, abruptly apiculate-acuminate, 7 or 9-plinerved leaves, and its lateral inflorescence.

23. MEDINILLA HIRSUTA sp. nov.

Frutex erectus 2 ad 3 m altus, ramulis subtus foliis inflorescentiisque plus minusve dense setoso-hirsutis; foliis oppositis, oblongo-obovatis, basi angustatis, sessilibus vel subsessilibus, pinnatim 9-plinerviis; inflorescentiis axillaribus, brevibus, densis, bracteis bracteisque ovatis ad orbiculari-ovatis, usque ad 14 mm longis, persistentibus, hirsutis; floribus ignotis; fructibus ovoideis, 5-locellatis, dense hirsutis.

An erect shurb 2 to 3 m high. Branches terete, light-gray, the older ones glabrous, the younger parts densely hirsute-setose with long, spreading, pale hairs, the nodes very densely setose. Leaves opposite, chartaceous, of about the same color on both surfaces when dry, rather pale, oblong-obovate, 10 to 18 cm long, 4 to 9 cm wide, apex acuminate, base spatulately narrowed, sessile or subsessile, the upper surface glabrous, the lower surface prominently hirsute with spreading hairs, especially on the nerves, nerves 4 pairs, all leaving the midrib in the lower one-half or one-third, ascending, the two inner pairs reaching the apex of the leaf, about as prominent as the midrib, the next outer pair reaching beyond the middle, there becoming obsolete, the basal pair much shorter. Inflorescence axillary, short, few-flowered, 3 cm long or less, all parts hirsute with long, pale, spreading hairs. Flowers unknown. Bracts persistent, greenish-white, broadly ovate to suborbicular, 10 to 14 mm long, 5- to 7-nerved, concave, setose-hirtuse on the outside. Pedicels about 5 mm long, setose. Fruit ovoid, about 8 mm long, densely hirsute with pale spreading hairs, green, the limb with 5 rather broad teeth.

MINDANAO, District of Zamboanga, Sax River Mountains back of San Ramon, *Merrill 8296*, November 27, 1911, in forests, altitude about 900 m. BASILAN, *Bur. Sci. 16085 Reillo*, Sept., 1912.

Well characterized by its setose-hirsute indumentum; very closely allied to *Medinilla attenuata* Elm., which it greatly resembles, from which it apparently differs in its larger, always opposite, more numerously nerved leaves.

24. **MEDINILLA VENOSA** (Blume) Blume in Flora 14 (1831) 518; Miq. Fl. Ind. Bat. 1[1] (1856) 549; Triana in Trans Linn. Soc. 28 (1873) 88 *t. 7, fig. 94 e;* Cogn. in DC. Monog. Phan. 7 (1891) 600.

Melastoma venosum Blume Bijdr. (1826) 1075.
Hypenanthe venosa Blume Mus. Bot. Lugd. Bat. 1 (1849) 21.

This species was first credited to the Philippines by Triana on specimens collected in Luzon by Cuming and by Lobb. Doctor C. B. Robinson, who has recently examined the material representing this species in the Paris Herbarium, the Rijks Herbarium, Leiden, and in the Kew Herbarium, considers the Luzon specimens to be correctly named, namely *Cuming 802*, from Mount Banajao, *Lobb s. n.*, not definitely localized, and *Vidal 1388* from Mount Maquiling, Province of Laguna, Luzon. Doctor Robinson has kindly supplied me with carbon leaf-rubbings of the three Philippine specimens cited above, and also from specimens in the Leiden Herbarium, Celebes, collected by *Forsten*, and a specimen in the Paris Herbarium from Ternate collected by *Hombron*. They all appear to represent a single species, and all are cited by Cogniaux under Blume's species. There is in the Herbarium of the Bureau of Science a single specimen that is referable here, *Tamesis s. n.*, from Mount Maquiling, Province of Laguna, Luzon, July, 1910.

But for the fact that the original diagnosis of *Axanthes philippensis* C. & S.=*Medinilla philippensis* Merr. describes the fruit of that species as 5-celled, I should, with little hesitation, reduce that species to *Medinilla venosa* Blume, for the vegetative characters of the two are very similar. *Medinilla lagunae* Vid., is also closely allied, but differs in its leaf-base and other characters. *Medinilla halconensis* Merr., is distinguished by its 5-merous flowers, and is more closely allied to *M. philippensis* Merr., than to *M. venosa* Bl.

25. **MEDINILLA TRUNCIFLORA** nom. nov.

Medinilla cauliflora Merr. in Philip. Journ. Sci. 5 (1910) Bot. 207, non Hemsl. (1895).

The above new name is necessary on account of Hemsley's use of the name *Medinilla cauliflora* in 1895, which was overlooked by me. In addition to the type, I have also before me one additional specimen, also from Negros, Canlaon Volcano, *Merrill 6983*, April, 1910, in forests, altitude about 800 m, a single plant observed.

26. **MEDINILLA MULTINERVIA** sp. nov.

Frutex scandens, subtus foliis ad nervos minute brunneo-furfuraceis exceptis glaber; ramis crassis, teretibus, junioribus 4-angulatis, 4-alatis, aliis crispulis; foliis oppositis, petiolatis, late ovatis vel late elliptico-ovatis, usque ad 20 cm longis, basi rotundatis, 13-plinerviis, nervulis transversalibus subparallelis, prominentibus; inflorescentiis lateralibus, brevibus, paucifloris; floribus 6-meris.

A scandent shrub, glabrous except the lower surfaces of the leaves which are minutely brown-furfuraceous especially on the nerves. Branches rather stout, terete or subterete, about 8 mm

in diameter, grayish, often striate, the younger ones 4-angled, 4-winged, the wings narrow, crisped. Leaves opposite, chartaceous or membranaceous, brownish-olivaceous when dry, of about the same color on both surfaces, shining, broadly ovate to elliptic-ovate, 15 to 20 cm long, 11 to 14 cm wide, the base rounded, the apex abruptly and rather prominently acuminate, the acumen nearly 1 cm long; nerves 13, prominent, leaving the midrib at intervals up to 4 cm above the base, the inner three pairs reaching the apex; transverse nervules numerous, parallel, prominent; petioles 3 to 5 cm long. Inflorescence from the branches below the leaves, the peduncles solitary or fascicled, 1- to 3-flowered, about 1.5 cm long, the bracts few, lanceolate, about 5 mm long. Flowers not seen. Fruits ovoid, green, glabrous, about 1.5 cm long, crowned by the truncate and minutely 6-denticulate calyx-rim, 6-celled.

LEYTE, Dagami, Mount Ibuni, *Bur. Sci. 15386 Ramos*, August 23, 1912, on trees in damp forests along streams.

A very strongly marked species, characterized by its many-nerved, abruptly acuminate leaves which have very prominent subparallel transverse nervules, its branchlets narrowly 4-winged, the wings crisped, its short lateral inflorescences, and its large, 6-celled, fruits which are 6-denticulate at the apex. It does not appear to be closely allied to any previously described species.

27. MEDINILLA LOHERI sp. nov.

Frutex erectus vel scandens, partibus junioribus plus minusve setosis, ramulis teretibus, nodis dense setosis; foliis oppositis, in paribus valde inaequalibus, altero oblongo, acuminato, usque ad 25 cm longo, pinnatim 5-plinervio, petiolato, altero sessile, spathulato, amplexicaule, 2 ad 3 cm longo; floribus racemosis, racemis axillaribus, brevibus, dense multifloris; floribus 4-meris.

A shrub, erect or scandent, the branches terete, the younger ones about 3 mm in diameter, hirsute-setose, the hairs pale, deciduous, the nodes very densely setose. Leaves opposite, chartaceous, those of each pair very unequal in size and shape, the larger of each pair oblong, 20 to 25 cm long, 7 to 11 cm wide, sometimes slightly falcate, flat, the lower surface much paler than the upper when dry, glabrous, apex slenderly and sharply acuminate, base somewhat inequilateral, rounded; nerves 5 on each side of the midrib, all leaving the midrib in the lower one-third, ascending, the innermost two pairs reaching the apex, prominent, the reticulations horizontal, subparallel, prominent; petiole about 2 cm long when young ciliate-hirsute, becoming glabrous: the smaller leaf of each pair sessile, clasping the stem,

spathe-like, 2 to 3 cm long, prominently longitudinally about 9-ribbed. Racemes axillary, solitary or two in an axil, about 3 cm long, the upper two-thirds of the rachis densely covered with pedicels, each pedicel subtended by several, radiate, persistent, linear, 1 mm long bracteoles, the pedicels about 5 mm long. Flowers unknown. Fruits urceolate, 6 to 7 mm long, 4 mm in diameter, 4-celled, the limb produced about 2 mm above the ovary, truncate, with 4 small, narrow, projecting, distant teeth.

LUZON, Province of Rizal, Oriud, *Loher 6280*, August, 1905 (type); Mabacal, *Loher 6299*.

A species well characterized by its very unequal leaves, one of each pair petioled, large and flat, the other small, sessile, spathe-like, and clasping the stems; very closely allied to *Medinilla disparifolia* C. B. Rob., but the leaves quite gabrous on both surfaces, not hirsute. Both species, when flowers are known, may be found to be referable to some other genus.

28. MEDINILLA GRACILIPES sp. nov.

Frutex epiphyticus, ramulis junioribus foliis subtus ad nervos inflorescentiisque plus minusve ferrugineo-pilosis, foliis oblongo-lanceolatis, usque ad 25 cm longis, oppositis, petiolatis, subcoriaceis, acutis vel breviter acuminatis, basi acutis, 5-plinerviis, nervis transversalibus subobsoletis; inflorescentiis e axillis defoliatis, longe graciliterque pedunculatis, floribus paucis, confertis, 4-meris.

An epiphytic shrub, the younger branches, lower surfaces of the leaves on the midrib and nerves, petioles, and inflorescence more or less densely ferruginous-pilose. Branches stout, glabrous, subterete or somewhat 3-angled, the growing parts rather densely ferruginous-pilose. Leaves opposite, oblong-lanceolate, subcoriaceous, 20 to 25 cm long, 6 to 10 cm wide, narrowed above to the acute or somewhat acuminate apex, the base acute or somewhat obtuse, the upper surface somewhat olivaceous, glabrous, shining, the lower somewhat brownish when dry, slightly shining, glabrous except the midrib and nerves; nerves two pairs, from above the base, the outer pair faint, the inner pair prominent, reaching the apex, the transverse nerves subobsolete; petioles stout, pilose, about 1 cm long. Inflorescence solitary, from the axils of fallen leaves, the peduncles slender, somewhat pilose, about 12 cm long, the floriferous part short, 3 to 5 cm long, ovate, the lower branches 1.5 cm long or less. Flowers paniculately arranged, few, rather densely disposed, the bracts small, oblong, about 3 mm long, the bracteoles smaller. Calyx urceolate, 3 mm long, truncate, the teeth represented by thickenings of the rim. Petals 4, narrowly oblong-obovate,

somewhat obtuse at the apex, 5.5 mm long. Stamens 8, equal, the filaments slender, 3 mm long, more or less thickened above the slender base; anthers lanceolate, acuminate, 4 mm long, the dorsal appendage very short, brown, the two anterior ones oblong-obovate, obtuse, 0.5 mm long.

LEYTE, Mount Ibuni, near Dagami, *Bur. Sci. 15228 Ramos*, August 23, 1912, on trees in the mossy forest.

A strongly marked species, characterized by its opposite, oblong-lanceolate, 5-plinerved leaves and its axillary, solitary, very long and slenderly peduncled inflorescences. It does not appear to be closely allied to any previously described species.

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ASCOMYCETES PHILIPPINENSES, II

By H. REHM

(*Munich, Germany*)

PERISPORIACEAE

MELIOLA Fries

MELIOLA UVARIAE Rehm sp. nov.

Mycelium in epiphyllo haud mutato plagas orbiculares 0.5 ad 2 cm latas formans in ambitu fuscidulas, in centro floccose nigras. Hyphae mycelii primariae plurimae, rectae, septatae, vix ramosae, dilute fuscidulae, 3 ad 4 μ latae, centrifuge repentes, itemque hyphae mycelii propriae, arachnoideo-centrifuge extensae, subramosae, septatae, fuscae, circ. 8 μ latae, ambitum plagae tenerum fuscidulum reddentes. Hyphopodia capitata plurima, plerumque monosticha, 2-cellularia, clavata, usque ad 20 μ alta, cellula superiore 15 ad 20 μ lata, hyphopodia uncinata nulla conspicua. Perithecia versus centrum plagae dispersa, globulosa, atra, glabra, poro haud pertusa, circ. 250 μ diam. Setae plurimae circa perithecium in mycelio coacervatae, erectae, interdum subcurvatae et verrucosulae, septatae, fuscae, apice obtuso dilutiores, usque ad 350 μ altae, 7 ad 10 μ latae. Asci ovato-clavati, usque ad 100 x 25 ad 30 μ, 8-spori. Sporae oblongae, rectae, utrinque rotundatae, 3-septatae, medio interdum subconstrictae, demum fuscae, 40 x 10 ad 12 μ, distichae. Paraphyses nullae. Adsunt conidia plurima ad hyphas mycelii adnata, interdum hyphopodio opposita, fusiformia, 4-septata, in stipitem tenuem hyalinum elongata, subfusca, usque ad 50 x 9 ad 10 μ.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 680*, Jan., 1913. Ad folia *Uvariae*.

Nähert sich der *Meliola insignis* Gaill., Meliola 44, unterscheidet sich aber wesentlich durch Form der Hyphopodien und Sporen, 8-sporige Schläuche und den Mangel büschelartig verklebter Setae, wie von Gaillard l. c. *tab. 6, f. l.* gegeben. Das *Helminthosporium* unserer Art entspricht dem für *Meliola argentina* Speg. angegebenen. Cfr. Gaillard, 45.

MELIOLA ACALYPHAE Rehm sp. nov.

Mycelium imprimis hypophyllum, plagulas dispersas, nigras, raro confluentes, orbiculares, 0.5 ad 1.5 mm latas formans, ex hyphis ad basim perithecii centrifugis, rectis, vix ramosis, usque ad 10 μ latis, septatis, parvicellularibus, arcte agglutinatis, fuscis, apice dichotomis compositum. Hyphopodia permulta, oblonga, obtusa, recta, 2-cellularia, opposita, fere juxtaposita, 20 x 10 μ, hyphopodia uncinata fusca, opposita, rara, usque ad 20 x 10 μ. Setae nullae. Perithecia in medio mycelii pauca, sessilia, globulosa, atra, haud ostiolata, ex cellulis magnis, convexule prominentibus contexta, circ. 150 μ. Asci bispori. Sporae oblongae, obtusae, rectae, 4-septatae, vix ad septa constrictae, fuscae, 30 ad 35 x 12 ad 14 μ.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 483.* Ad folia *Acalyphae stipulaceae.*

Bildet kleine schwarze Flecken mit eng aneinanderliegenden, von reichsten Hyphopodien besetzten, kurzzelligen Hyphen und weicht dadurch von *Meliola melostomacearum* ganz ab.

MELIOLA ARACHNOIDEA Speg. Fung. Puigg. no. 237. Cfr. Gaillard, Meliola l. c. 51; Sacc. Syll. 9: 413; Theissen in Broteria 9: 25.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 485.* Ad folia *Triumfettae semitrilobae.*

Mycelium inter pilos foliorum parce evolutum!

MELIOLA PARENCHYMATICA Gaillard, Bull. Soc. Myc. Fr. 8: 180, *tab. 15, f. 5.* Cfr. Sacc. Syll. 11: 263.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 482,* ad paginam superiorem *Sapindi Turczaninowii; C. F. Baker 487,* ad folia *Rottboelliae exaltatae; C. F. Baker 557,* ad folia *Desmodii gangetici.*

MELIOLA ? DESMODII Karst. & Roum. Rev. Myc. (1890) 77. Cfr. Gaillard, Meliola l. c. 83, *pl. 14, f. 6;* Sacc. Syll. 9: 115.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 556.* Ad folia *Desmodii gangetici.*

Passt sehr gut zur Beschreibung, nur sind die Sporen 30–35 x 10–12 μ, bei Gaillard 40–45 μ.

MELIOLA ? STENOSPORA Winter, Hedwigia (1886) 97. Cfr. Gaillard, Meliola l. c. 86, *tab. 15, f. 4;* Sacc. Syll. 9: 423.

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 94.* Ad folia *Ehretiae Navesii.*

MELIOLA COOKEANA Speg. F. Argent. 4: 41. Cfr. Gaillard, Bull. Soc. Myc. Fr. 7: 73. *tab. 13;* Sacc. Syll. 1: 65; Ell. & Ev. N. Am. Pyr. 46; Theissen in Broteria 10: 30. Exsicc. Ravenel, Fung. Am. 84, Ellis, N. Am. Fung. 1295.

Meliola amphitricha f. *Callicarpae americanae* Cooke apud Ravenel.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 481.* Ad folia *Callicarpae canae.*

Stimmt vortrefflich, nur erscheinen die Perithecien nicht stark warzig.

MELIOLA MERREMIAE Rehm sp. nov.

Mycelium epiphyllum plagulas orbiculares, nigras, vix radiantes, 1 ad 1.5 mm latas formans ex hyphis rectis, centrifugis, fuscis, septatis, 7 ad 8 μ latis, dichotomis rectangulariter, arcte juxtapositis. Hyphopodia plurima, recta, obtusa, 2-cellularia, cellula inferiore perparvula, in longa serie propinque opposita, fusca, 10 ad 12 x 6 μ. Hyphopodia uncinata opposita, mucronata, fusca, 15 x 6 μ. Setae myceliales rectae, septatae, ad basim usque ad 10 μ latae, apice obtusae, fuscae. Perithecia dispersa, globulosa, astoma, haud verruculosa, atra, circ. 120 μ. Asci ? Sporae oblongae, rectae, obtusae, 4-septatae, fuscae, 30 ad 35 x 10 ad 12 μ.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 484*. Ad folia *Merremiae hastatae*.

Steht der *Meliola praetervisa* Gaillard, Meliola 78, nahe, unterscheidet sich durch viel kleinere Sporen und stumpfe Setae; von *Meliola malacotricha* Speg. durch die verschiedene Form der Hyphopodien.

MELIOLA HEWITTIAE Rehm sp. nov.

Mycelium maculas orbiculares epiphyllas 2 ad 2.5 mm latas, interdum confluentes, nigras, tenuissimas, margine subarachnoideas formans ex hyphis sparse ramosis, 6 ad 7 μ latis, fuscis, arcte aggregatis, breviter cellularibus. Hyphopodia capitata numerosissima, opposita, oblonga, 2-cellularia, breviter stipitata, cellula superiore obtusa, 15 x 7 μ. Hyphopodia mucronata opposita vel solitaria, ampulliformia, pallidiora, usque ad 17 x 6 ad 10 μ lata. Setae myceliales sparsae, erectae, circ. 200 μ longae, ad basim 7 μ latae, apice acutatae, fuscae. Perithecia dispersa, globulosa, astoma, haud verrucosa, nigra, circ. 130 μ. Asci 2- vel 3-spori. Sporae cylindraceae utrinque obtusae, rectae, 4-septatae, non constrictae, dilute fuligineo-fuscae, 35 ad 37 x 14 μ.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 555*. Ad paginam superiorem foliorum decoloratorum *Hewittiae sublobatae*.

Eine durch kleine Fleckenbildung mit eng zusammengedrängten, aüsserst zahlreiche längliche Hyphopodien-tragende Hyphen auffällig gekennzeichnete Art.

MELIOLA BIDENTATA Cooke, Grevillea 6: 37. Cfr. Sacc. Syll. 9: 417; Gaillard, Meliola l. c. 106, *pl. 19, f. 3:* Ell. & Ev. N. Am. Pyr. 46. *pl. 5;* Theissen in Broteria 9: 37. Exsicc. Rabenh. Winter Fung. Eur. 3546, Ellis N. Am. Fung. 1297 a, b, 2545, Ravenel, Fung. Am. 330.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 480*. In pagina superiore foliorum *Litseae Perrottetii*.

Setis apice demum saepe irregulariter 4-dentatis transitus ad *Meliola bicornis* Winter.

MELIOLA BICORNIS Winter, Hedwigia (1886) 99. Cfr. Gaillard, Meliola l. c. 99, *tab. 18, f. l.;* Sacc. Syll. 9: 422; Theissen in Broteria 9: 27. Exsicc. Rabenh. Winter Fung. Eur. 3545, Rehm, Ascom. 1348.

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 83.* Ad folium?

DIMERIUM Saccardo & Sydow

DIMERIUM PSEUDOPERISPORIOIDES Rehm sp. nov.

Perithecia in medio macularum epiphyllarum, orbicularium, nigritularum, 0.5 ad 1 cm diam. densissime, versus marginem sparsa sessilia, globulosa, nigra, glabra, ad basim hyphas nonnullas brevissimas, fuscidulas, 3 ad 5 μ latas gerentia, haud ostiolata, 100 μ diam. Asci 5 vel 6, globoso-ovoidei, usque ad 35 μ lati, 8-spori. Sporae oblongae vel subclavatae, utrinque obtusae, medio septatae et constrictae, subfuscae, 10 ad 12 x 5 ad 6 μ. Paraphyses gelatinosae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 631.* Ad folia *Ipomoeae.* Nur Sporen eines Mycels sind nachweisbar.

MICROTHYRIACEAE

MICROTHYRIUM Desmazières

MICROTHYRIUM ELATUM Rehm sp. nov.

Perithecia in maculis nigris, primitus orbicularibus, 0.5 mm latis, mox vario modo confluentibus in maculas ellipsoideas, irregulares, usque ad 3 cm longas, 1 cm latas innata, solitaria, rarius congregata, globosa, 100 μ diam., epidermium cellulis fusco-violacee impletis violacee fuscidule decoloratum hemisphaerice elevantia vel longitudinaliter plicantia, poro minutissimo aperta, excipulo proprio carentia. Asci clavati, apice rotundati, sessiles, 60 x 15 μ, 8-spori. Sporae ovoideae, infra medium, rarissime medio septatae, haud constrictae, hyalinae, 15 x 7 ad 8 μ, distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 28.* Ad petiolos emortuos *Coryphae elatae.*

Ohne erkennbares eigenes Gehäuse liegen die Perithecien unter der schwarzen Decke, ein eigentliches Stroma ist nicht vorhanden: deshalb ist die richtige Stellung bei *Microthyrium* gegeben. Im ganzen Bau scheint nahe Verwandtschaft mit *Microthyrium ? circinans* Speg. Fl. Argent. 4: No. 151 gegeben. Cfr. Sacc. Syll. 2: 665.

MICROPELTIS Montaigne

MICROPELTIS CORRUSCANS Rehm sp. nov.

Perithecia in foliorum vivorum pagina inferiore decolorata crispataque gregarie sessilia, dimidiato-scutata, poro pertusa, centrifuge fusce contexta, glabra, ad marginem hyphis nonnullis

septatis fuscidulis usque ad 25 μ longis obsessa, 100 μ diam. Asci clavati, sessiles, 8-spori, 30 x 10 μ. Sporae oblongae, obtusae, rectae, medio septatae, non constrictae, utrinque biguttulatae, dein 4-cellulares, hyalinae, 9 ad 12 x 3 ad 3.5 μ. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 621.* Ad folia *Synedrellae nodiflorae.*

Der winzige Pilz findet sich nur an den verkrüppelten und verfärbten Blättern.

MICROPELTIS LEUCOPTERA Penz. & Sacc. in Malpighia 11: 525. Cfr. Sacc. Syll. 14: 690.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 531 b.* Ad culmos *Schizostachyi acutiflori.*

Micropeltis applanata Mont., *M. albo-marginata* Speg., *M. leucoptera* Penz. & Sacc., *M. Schmidtiana* Rostr. stellt von Höhnel, als nahe verwandte Arten, sub *Phragmothyrium.* Cfr. von Höhnel Fragm. Myc. 14: 8.

HYPOCREACEAE

MALMEOMYCES Starbäck

MALMEOMYCES PULCHELLUS Starb. Vet. Ak. Hdl. 25³: 32. Cfr. Sacc. Syll. 16: 592.

Perithecia gregaria, sessilia, globulosa, atra, parenchymatice fusce contexta, membranacea, 0.15 mm diam., setis singulis, ad basim subcurvatis, apice obtusis, septatis, fuscis, circ. 100 μ longis, ad basim usque ad 8 μ latis obsessa. Asci fusoidei, sessiles, 50 x 14 μ, 8-spori. Sporae oblongae, rectae, utrinque obtusae, 1- dein 3-septatae, medio constrictae, cellulis 1 magniguttatis, 20 ad 24 x 5 μ, oblique distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 478 b.* Ad *Bambusam* emortuam.

Die Beschreibung von Starbäck stimmt mit obiger gut überein, so dass ich diesen Namen annehme, auch finden sich die gleichen Setae zwischen den einzelnen Perithecien und ist dadurch ein schwärzlicher Flecken. gebildet. Indessen sind bei dem oben beschriebenen Pilz die Perithecien durchaus nicht "corneo-membranacea." Jedenfalls steht derselbe *Calonectria* nahe.

OPHIONECTRIA Saccardo

OPHIONECTRIA TRICHOSPORA (B. & Br.) Sacc. Syll. 2 (1883) 563.
Nectria trichospora B. & Br. Fung. Ceyl. 115.

Perithecia gregaria, ovalia, distincte papillulata, coccinea, glabra, sicca asperula, apice haud umbilicata, 0.3 ad 0.4 mm alta et lata, parenchymatice cellulis orbicularibus 15 ad 18 μ latis contexta, membranacea. Asci fusiformes, usque ad 240 x 30 μ

8-spori. Sporae aciculares, apice superiore obtusae, inferiore longiacutatae, usque ad 220 x 8 ad 10 μ medio, hyalinae, usque ad 24-cellulares, 2- vel 3-stichae, extra ascum curvatae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 563*. Ad frustula in sylvis.

Das Exemplar stimmt so vortrefflich zu der wenn auch unvollständigen Beschreibung von B. & Br. l. c., dass ich an der Zugehörigkeit nicht zweifle. Die Art unterscheidet sich von allen übrigen durch Form, Grösse und Farbe der Perithecien, dann durch die prächtig entwickelten, langen, vielzelligen Sporen.

DOTHIDEACEAE

PHYLLACHORA Nitschke

PHYLLACHORA ANDROPOGONIS Karst. & Hariot. Rev. Myc. (1898) Cfr. Sacc. Syll. 9: 1027.

LUZON, Prov. Laguna, Los Baños, *Doctor E. B. Copeland*, comm. *C. F. Baker 509*. Ad folia *Andropogonis halepensis* var. *propinqui*.

Specimen orig. herb. mei "Timor Oceaniae" exacte convenit.

PHYLLACHORA PAHUDIAE Sydow.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 627*. In foliis *Pahudiae rhomboideae* (*Afzeliae rhomboideae*).

PHYLLACHORA FICI-MINAHASSAE P. Henn. Hedwigia 47 (1908) 254.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 685*, Jan. 1913. Ad folium *Fici minahassae*.

AUERSWALDIA Saccardo

AUERSWALDIA MERRILLII P. Henn. Hedwigia 47 (1908) 253.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 396, W. H. Brown*, comm. *C. F. Baker 691*. In foliis *Freycinetiae*.

Sporen höchstens im Alter bräunlich, deshalb ist diese Art besser *Phyllachora* zu nennen.

SPHAERIACEAE

NEOPECKIA Saccardo

NEOPECKIA DIFFUSA (Schwein.) Sacc. Syll. 11: 317. Cfr. Sacc. Syll. 14: 553; von Höhnel Fragm. Myc. 6: 64; 7: 25.

Sphaeria diffusa Schwein. Syn. N. Am. Fung. 1542 var. *atrata* (Penz. & Sacc.).

Letendraea atrata Penz. & Sacc. Ic. Fung. Jav. (1904) 46, *tab. 32, f. 3*.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 560*. Ad frustula ligni.

Die Angaben von von Höhnel l. c. stimmen in jeder Beziehung und gehören die Exemplare dazu "Asci 100 x 12 μ. Sporae 15–18 x 5–6 μ utraque cellula 1–2 magniguttata, medio constrictae, dilute fuscidulae, distichae."

ROSELLINIA De Notaris

ROSELLINIA EMERGENS (B. & Br.) Sacc. Syll. 1: 257.

Sphaeria (*Byssiseda*) *emergens* B. & Br. Fung. Ceyl. 1089.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 502*. Ad truncum emortuum.

Von allen bisher beschriebenen Arten der "byssidedae" durch die ausserordentlich grossen Sporen verschieden.

MYCOSPHAERELLACEAE

STIGMATEA Fries

STIGMATEA CINEREO-MACULANS Rehm sp. nov.

Perithecia maculis epiphyllis dilute cinereis, rarissime atro-marginatis, orbicularibus, 0.5 ad 1 mm latis, mox in latas plagas confluentibus innata, primitus singula, lenticularia, hemiglobose prominentia, atra, poro pertusa, glabra, 0.2 mm lata, membranacea, parenchymatice fuscidule contexta. Asci cylindracei, 25 x 3 ad 3.5 μ, plerumque 4-spori. Sporae ellipsoideae, utrinque rotundatae, medio septatae, non constrictae, utraque parte 2-guttulata, hyalinae, 6 ad 7 x 2 μ, 1-stichae. Paraphyses haud conspicuae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 622*. Ad vaginam foliorum *Pandani*.

Stigmatea Pandani Pat. Bull. Soc. Myc. Fr. (1904) 136, ist durch viel grössere Sporen in ovalen Schläuchen ganz verschieden. Cfr. Sacc. Syll. 1: 656.

PLEOSPORACEAE

LEPTOSPHAERIA Cesati & De Notaris

LEPTOSPHAERIA AMBIENS Rehm sp. nov.

Perithecia ramulum longe dilute fuscidulum ambientia, innumerabiliter gregarie cortici interiori innata, epidermidem vix protuberantia, ostiolis minimis prominentibus nigris punctulantia, globulosa, atra, 0.15 mm diam., parenchymatice fusce contexta, ad basim hyphis simplicibus, fuscis, septatis, 3 μ crassis obsessa. Asci clavati, teneri, 40 ad 45 x 8 ad 9 μ, 8-spori. Sporae oblongo-clavatae, utrinque obtusae, primitus medio, dein 3-septatae, vix constrictae, rectae, fuscae, 12 x 4 μ, distichae. Paraphyses filiformes, tenerae.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 529*. Ad ramulos emortuos?

Mit den kleinen, in keuligen Schläuchen 2-reihig liegenden, dunkelbraunen Sporen steht der Pilz zunächst *Leptosphaeria sabalincola* (E. & M.) Sacc. Syll. 9: 368, ist aber nach Exsicc. Ell. & Ev. N. Am. Fung. 1936 im Übrigen ganz davon verschieden.

CLYPEOSPHAERIACEAE

ANTHOSTOMELLA Saccardo

ANTHOSTOMELLA GRANDISPORA Penz. & Sacc. Malpighia 11 (1897) 392. Cfr. Sacc. Syll. 14: 502.

Var. SCHIZOSTACHYI Rehm var. nov.

Perithecia creberrima, innata cortici, solitaria vel longitudinaliter longe seriata, per epidermidem haud nigritulam, striaeformiter vel laciniatim diruptam ostiolo minimo prorumpentia, globulosa, atra, membranacea, hyphis fuscis, plerumque simplicibus, fuscis nonnullis, demum mycelium formantibus ad basim obsessa, 0.2 mm diam. Asci oblongi, crasse tunicati, apice rotundati, circ. 90 x 25 μ, 8-spori. Sporae oblongo-ellipsoideae, 1-cellulares, fuscae, 28 ad 30 x 10 ad 12 μ, distichae. Paraphyses filiformes, septatae, 2 μ crassae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 531 a.* Ad culmos emortuos *Schizostachyi acutiflori.*

ANTHOSTOMELLA MIRABILIS (B. & Br.) von Höhnel Fragm. Myc. 6: 54.

Astrocystis mirabilis B. & Br. Journ. Linn. Soc. Bot. 14 (1878) 123. Cfr. Sacc. Syll. 1: 293.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 475.* Ad *Bambusam* emortuam, adhuc stantem.

Zeigt an den circa 1 mm breiten Perithecien genau an deren Grund die geschwärzten zerrissenen Epidermis-Lappen, wie in Rehm Ascom. exsicc. 1859, hat aber schmälere Sporen.

VALSACEAE

CRYPTOSPHAERIA Greville

CRYPTOSPHAERIA PHILIPPINENSIS Rehm sp. nov.

Stroma cortici innatum, peridermium dilute cinereum distincte maculiformiter elatum in plagulis irregulariter orbicularibus, plus minusve longitudinaliter usque ad 3 cm longis, 1 cm latis, undulatim confluentibus, demum ab peridermio diffracto nigre marginatis, intus linea nigra tenuissima notatis. Perithecia monosticha, dense gregaria, globosa, cortici haud mutato innata, 0.15 mm diam., ostiolo hemisphaerico, punctiformi, atro, in peridermio conspicua. Asci clavati, in stipitem tenuem, usque ad 40 μ elongati, parte sporifera 25 x 8 μ, 8-spori. Sporae allantoideae, hyalinae, 8 ad 9 x 2 μ, 2- vel 3-stichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 561 b.* Ad ramum emortuum in humo jacentem.

Steht im Allgemeinen der *Cryptosphaeria Crepiniana* Sacc. & Roum.

Rev. Myc. (1893) *tab. 39, f. 1*, Sacc. Syll. 9: 471, Berl. Ic. 3: 36, *tab. 44, f. 1*, sehr nahe, besonders in der Grösse der Sporen, unterscheidet sich aber völlig durch die äusserst kleinen Perithecien.

EUTYPA Tulasne

EUTYPA BAMBUSINA Penz. & Sacc. Malpighia 11 (1897) 501. Cfr. Sacc. Syll. 14: 486.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 10, 613, 629.* Ad *Bambusam* emortuam.

Stroma intus flavescens.

MELANCONIDACEAE

CRYPTOSPORA Tulasne

CRYPTOSPORA BAMBUSAE Speg.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 478 a.* Ad *Bambusam* emortuam.

VALSARIA De Notaris & Cesati

VALSARIA CONSORS Rehm sp. nov.

Stromata ramulum ambientia, dispersa, in ligno late denigrato sub cortice nidulantia, demum prorumpentia, conoidea, atra, circ. 1 mm diam. Perithecia 8 ad 10 monosticha, globosa, nigra, 0.25 mm diam., in collum longum ambientia et in disculum hemiglobosum conjuncta, ostiolis conoideis parvulis prominentibus. Asci cylindracei, 90 ad 100 x 8 μ, 8-spori, I—. Sporae oblongae, biscoctiformiter medio constrictae et septatae, fuscae, 12 ad 14 x 5 ad 6 μ, 1-stichae. Paraphyses filiformes, hyaline.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 561 a.* Ad ramulum emortuum in humo jacentem.

Am gleichen Ästchen wächst *Cryptosphaeria philippinensis* Rehm. Die Art steht in allen Beziehungen nahe der *Valsaria staphylina* Ell. & Ev. (cfr. Sacc. Syll. 11: 318), dann *Valsaria Kriegeriana* Rehm (cfr. Sacc. Syll 17: 691), welche sich insbesondere durch ihre kleinen Sporen von den übrigen Arten unterscheiden.

MELOGRAMMATACEAE

BOTRYOSPHAERIA Cesati & De Notaris

BOTRYOSPHAERIA BAKERI Rehm sp. nov.

Stromata gregaria, cortici innata, erumpentia, orbicularia, 1 ad 2.5 mm diam., atra. Perithecia immersa, 4 ad 6, globuloso-conoidea, arcte juxtaposita, dein discreta, nigro-fusca, rugoso-verrucosa, minutissime papillulata, parenchymatice fusce contexta, 0.4 ad 0.5 mm lata et alta, hyphis subramosis, fuscis, 4 ad 5 μ latis obtecta conjunctaque, sicca apice umbonata. Asci cylindracei, apice rotundati, crasse tunicati, usque ad 200 x 20 μ, 8-spori, I—. Sporae ellipsoideae, utrinque rotundatae, 1-cell-

ulares, saepe 1 magni-guttatae, hyalinae, 30 x 15 ad 16 μ juveniles oblongae, 30 x 8 μ, utraque strato mucoso 5 μ lato obductae, demum dilute flavidulae, 1-stichae. Paraphyses ramosae, septatae, 2 μ crassae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 696*, Jan., 1913. Ad ramulos decorticatos.

Stimmt gut zu *Botryosphaeria Hoffmanni* von Höhnel, Ann. Myc. (1904) 275, unterscheidet sich aber durch die Mycel bedeckten, getrennten grossen Perithecien mit Papille. Am nächsten verwandt ist wohl *Botryosphaeria Pruni* MacAlp. Fung. Diseases (1902) 119, *f. 617–200*, jedoch ist hier das beträchtliche stratum mucosum nicht angeführt.

XYLARIACEAE

NUMMULARIA Tulasne

NUMMULARIA ANTHRACODES (Fr.) Cooke, Grevillea 11: 126; 12: 8. Cfr. Sacc. Syll. 1: 365, 9: 572.

Sphaeria anthracodes Fr. Linnaea (1830) 544.
Hypoxylon anthracodes Mont. Ann. Sci. Nat. 13 (1840) 359.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 589*. Ad lignum decorticatum in humo jacentem.

HYPOXYLON Bulliard

HYPOXYLON RUBIGINOSUM (Pers.) Fr. S. V. Sc. 384. Cfr. Sacc. Syll. 1: 376.

Sphaeria rubiginosa Pers. Syn. Fung. 11.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 504*. Ad lignum putridum.

DALDINIA De Notaris & Cesati

DALDINIA LUZONENSIS Rehm sp. nov.

Stroma ex basi vix stipitiformi exsurgens demum late placentiformiter expansum, suborbiculare, lobulato-incisum, irregulariter compressum complanatumque, obtuse crasse marginatum, fusconigrum, usque ad 5 cm latum, 1 ad 2 cm altum, supera stromatis parte vix ostiolis minimis perspicuis punctulata, intus fibrosum, e basi adscendentibus plurimis horizontalibus parallelis concentricis fuscis, circ. 1 mm latis, stratis contextum. Asci arcte juxtapositi, subcylindracei, 1.5 mm longi, 0.5 mm lati, 8-spori. Sporae ellipsoideae, rectae vel curvatulae, 1-cellulares, fuscae, 10 x 4 ad 5 μ. Paraphyses destructae.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 516*. Ad truncum putrescentem.

Macht im Ganzen den Eindruck von *Hypoxylon placentiforme* B. & C., ist aber eine ächte *Daldinia*, zur Gruppe von *D. concentrica* (Bull.) Grev. gehörig, entbehrt aber fast jeder sichtbaren Andeutung der Ostiola und unterscheidet sich durch seine Form, sowie durch kleinere Sporen. Ausgestossene Sporen bedecken als schwarzer Überzug das Stroma oben.

XYLARIA Hill

XYLARIA GIGANTOCHLOAE Rehm sp. nov.

Stromata sessilia, solitaria, oblongo-conoidea, apice rotundata, ad basim contracta, vix nigre stipitata, glabra, fusca, 4 ad 5 mm alta, 3 ad 4 mm diam., undique usque ad apicem ostiolis minutissimis hemiglobosis atris punctulata, intus nigra, carbonaceae. Perithecia globulosa, innata, non prominentia, 100 μ diam. Asci cylindracei, 50 x 5 ad 6 μ, I—, 8-spori. Sporae ellipsoideae, plerumque 2-guttatae, 1-cellulares, fuscae, 7 ad 8 x 3 μ, 1-stichae. Paraphyses filiformes.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 616*. Ad *Gigantochloam Scribnerianam*.

Eine durch ihre Kleinheit höchst auffällige *Xylaria*, zu *Xyloglossa* gehörig, in den kleinen Sporen der *X. fulvella* B. & C. gleichend. *X. Trianae* Lév. Ann. Sci. Nat. (1863) 292. (cfr. Sacc. Syll. 9: 525) hat ebenso kleine Stromata, ist im Übrigen ganz verschieden.

XYLARIA (PENZIGIA) COMPUNCTA (Junghuhn) Berk. Dek. 482. Cfr. Sacc. Syll. 1: 325; 9: 569.

Sphaeria compuncta Junghuhn, Praem. Jav. (1838) 21.
Hypoxylon compactum Fr. Symb. Myc. 130.
Penzigia compuncta Sacc. & Paoli, Myc. Malac. no. 100.
Sarcoxylon conjunctum Cooke, Grevillea 12: 50.

LUZON, Prov. Laguna, Mount Maquiling, *C. F. Baker 479*. Ad truncum emortuum.

HYSTERIACEAE

LEMBOSIA Léveillé

LEMBOSIA EUGENIAE Rehm sp. nov.

Mycelium epiphyllum, plagas orbiculares, 0.5 ad 1.5 cm latas, nigricantes, haud distincte marginatas, dilute cinereo-fuscidulas, arcte adnatas formans, demum late effusum. Hyphae mycelii nudo oculo haud conspicuae, graciles, sparse utrinque ramosae, septatae, 3 ad 4 μ latae, hyphopodia cylindracea, unilateralia, ? 2-cellularia, fusca, recta, 10 x 2.5 μ gerentes. Perithecia dispersa, sessilia, atra, glabra, recta, linearia vel subfusiformia, rimoso-dehiscentia, 0.15 ad 0.2 mm longa, 0.1 mm lata, centrifuge contexta, ad basim in mycelium radiantia. Asci ovoidei 60 x 30 μ, 8-spori. Sporae oblongae, utrinque rotundatae, rectae, medio septatae et constrictae, demum fuscae, 20 ad 22 x 8 ad 9 μ, halone mucosa 5 μ lata obductae. Paraphyses filiformes.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 682, 681*. Ad folia *Eugeniae*.

Steht der *Lembosia decalvans* f. *Coccoli* Pat. Ann. Jard. Buitenz. 1 (1897) 182 nahe, unterscheidet sich aber durch die Beschaffenheit des Mycelium und ganz zerstreute Perithecien.

BULGARIACEAE

HAEMATOMYCES Berkeley & Broome

HAEMATOMYCES CARNEUS Rehm sp. nov.

Ascomata tremelloidea, orbiculatim multoties complicata, 1 ad 1.5 cm diam., 1 mm crassa, sinuato-lobata, gyrosa, obtuse marginata, coriacea, subgelatinosa, carneo-rubescentia, ad basim albescentia, glabra vel verrucosula, plectenchymatice contexta, hyphis 4 ad 5 μ latis, sessilia. Asci cylindracei, apice rotundati, crasse tunicati, 150 x 12 μ, I—, 8-spori. Sporae ellipsoideae, utrinque obtusae, interdum subcurvatulae, 1-cellulares, magni-2-guttatae, glabrae, hyalinae, 18 ad 20 x 9 μ, 1-stichae. Paraphyses filiformes, obtusae, 2 μ crassae, hyalinae. Color ascomatis in aqua solubilis.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 661*. Ad fragmenta lignea putrida, humijacentia.

Von Höhnel, Fragm. Myc. **6**: 126, stellt, ebenso wie Saccardo, Syll. **8**: 633 *Haematomyces* zu den *Bulgarieae* und zwar zunächst *Ombrophila* als unberandete Form. Vorliegende völlig entwickelte Exemplare zeigen keine von einer eigenen Gehäuse-Bildung ausgehende deutliche Berandung.

OMBROPHILA Fries

OMBROPHILA HELOTIOIDES Rehm sp. nov.

Apothecia sessilia, cyathoideo-stipitata, disco demum orbiculariter explanato, tenuissime marginato, usque ad 5 mm diam., stipite cylindraceo, 1 ad 1.5 mm longo, 0.3 mm lato, aurantiaco-rubra, stipite sicco albescente, carnoso-gelatinosa, parenchymatice contexta. Asci cylindracei, apice rotundati, usque ad 180 x 9 μ, 8-spori, I—. Sporae fusiformes, rectae vel subcurvatae, utrinque acutatae, 1-cellulares, hyalinae, 20 ad 24 x 3 μ, distichae. Paraphyses filiformes 1 μ, ad apicem dilute flavidulam 1.5 μ.

LUZON, Prov. Laguna, *C. F. Baker 528*. Ad ramum emortuum.

In Form und Farbe der *Ombrophila roseola* Bres. in Hedwigia (1896) 296, Sacc. Syll. 14: 802, sehr nahe stehend, aber durch die grossen Sporen ganz verschieden, ebenso von *Ombrophila aurantiaca* Massee und *O. rubescenti-rosea* Rehm (Cfr. Sacc. Syll. **16**: 767).

PEZIZACEAE (MOLLISIACEAE)

MELITTOSPORIOPSIS Rehm

MELLITOSPORIOPSIS GIGANTOSPORA (Rehm) Sacc. & Sydow in Sacc. Syll. **16**: 752.

Melittosporiopsis violacea Rehm f. *gigantospora* Rehm in Hedwigia (1892) 92.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 681 b*. Ad folia *Eugeniae*.

Auf den von den Resten einer ? *Seynesia* schwarz auf der Oberseite

bedeckten Blättern finden sich kleine Ansiedelungen des herrlichen Pilzes. Von Höhnel, Denkschr. Ak. Wiss. Wien 33 (1907) 32, stellt ihn als Flechte zu *Goniothecium* Wainio, Etud. zur Class. Nat. (1890) 29.

ASCOBOLACEAE

ASCOPHANUS Boudier

ASCOPHANUS TESTACEUS (Moug.) Phill. Man. Brit. Disc. 310, *pl. 9, f. 58.*

Peziza testacea Moug. in Fries El. Fung. 2 (1838) 11.
Helotium testaceum Berk. Outl. (1860) 372.
Ascobolus testaceus Berk. Ann. Nat. Hist. 1082, *tab. 14, f. 5.*

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo,* comm. *C. F. Baker 503.* Ad telam putrescentem in humo.

ASCOBOLUS Persoon

ASCOBOLUS LATUS Penz. & Sacc. Malpighia (1901) 218; Ic. Fung. Jav. *tab. 56, f. 3.* Cfr. Sacc. Syll. 18: 119.

Apothecia gregaria, primitus globosa, dein explanata, demum irregularia, obtuse marginata, extus pallide flavescentia, glabra, disco brunneolo, 3 mm ad 1.5 cm diam., sicca complicata, extus corrugata, margine saepe lacerato, disco atro. Asci clavati, longe stipitati, usque ad 300 x 25 μ, 8-spori. Sporae oblongae, haud reticulatae, glabrae, hyalinae, dein fusco-purpureae, 20 ad 22 x 10 μ, in asci superiore parte distichae. Paraphyses filiformes, 3 μ crassae, ad apicem vix latiores, septatae, gelatinose flavidule conglutinatae et Iodii ope coerulee tinctae. Hypothecium hyalinum.

LUZON, Prov. Laguna, Los Baños, *Doctor E. B. Copeland,* comm. *C. F. Baker 656.* Ad fimum equinum.

Entspricht, abgesehen von l. c. "paraphysibus sursum clavulatis, luteolis, 6–7 μ cr." mit dieser erweiterten Beschreibung der l. c. gegebenen so vortrefflich, dass die Identität angenommen werden kann.

TRYBLIDIACEAE

TRYBLIDIELLA Saccardo

TRYBLIDIELLA RUFULA (Spreng.) Sacc. Syll. 2: 757. Cfr. Rehm, Ann. Myc. 2: 524; Theissen, Ann. Myc. 6: 534.

Hysterium rufulum Spreng. Vet. Ak. Holm. (1820) 20.
Tryblidiella Balansae Speg. Sacc. Syll. 9: 1110.
Tryblidium quaraniticum Speg. Sacc. Syll. 9: 1103.
Rhytidhysterium quaraniticum Speg. Cfr. Sacc. Syll. 16: 666.
Rhytidhysterium javanicum Penz. & Sacc. Syll. 14: 534.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 668.* Ad caules emortuos *Paramigynae longipedunculatae.*

TRYBLIDIELLA MINDANAENSIS P. Henn. Hedwigia 47 (1908) 261.

LUZON, Prov. Laguna, Los Baños, *C. F. Baker 32, 527, 31.*

Schliesst sich eng an *Tryblidiella rufula* an, durch stumpfe, kürzere Apothecien und schwarze Fruchtscheibe verschieden.

THE PHILIPPINE JOURNAL OF SCIENCE, C. BOTANY.
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ENUMERATION OF PHILIPPINE FUNGI, WITH NOTES AND DESCRIPTIONS OF NEW SPECIES. PART I: MICROMYCETES.

By H. and P. SYDOW
(*Berlin, Germany*)

The fungi here recorded have been gathered by various collectors in different parts of the Philippine Islands, and have been submitted to us by Mr. E. D. Merrill, Manila, and by Mr. C. F. Baker, Los Baños, for determination.

MICROSTROMA Niessl

MICROSTROMA PHILIPPINENSE Syd. sp. nov.

Hypophyllum, minutum, niveum, sparsum vel aggregatum, haud maculicolum, caespites 0.5 ad 1 mm latos subinde confluendo majores efformans; basidiis lineari-cylindraceis, 50 ad 100 μ longis, 8 ad 10 μ crassis, erectis, fasciculatim per stomata erumpentibus, continuis, hyalinis; sporis oblongo-fusiformibus vel anguste ellipsoideis, continuis, hyalinis, 4 ad 8 μ longis, 2 ad 3 μ latis, sterigmatibus brevissimis suffultis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 626*, January 7, 1913. On living leaves of *Derris sp.*

USTILAGO Persoon

USTILAGO BURSA Berk.

LUZON, Subprovince of Benguet, *Merrill 7908*, May, 1911. In the ovaries of *Themeda triandra.*

USTILAGO SORGHI (Pass.) Lk.

LUZON, Province of Nueva Vizcaya, near Dupax, *Bur. Sci. 14360 McGregor*, March, April, 1912. In the ovaries of *Andropogon halepensis* var. *propinqua.*

TILLETIA Tulasne

TILLETIA OPACA Syd. sp. nov.

Soris ovaria incolentibus eaque omnino destruentibus et in corpora atra 1 ad 1.5 cm longa transformantibus, pulverulentis; sporis perfecte globosis, 17 ad 24 μ diam., primo fuscis, tandem obscure castaneo-brunneis et opacis, densissime minutissime et regulariter reticulatis.

LUZON, Province of Rizal, Parañaque, *W. R. Shaw*, July, 1911. In the ovaries of *Spinifex squarrosus.*

UROMYCES Link

UROMYCES APPENDICULATUS (Pers.) Lk.

COMIRAN ISLAND (Sulu Sea), *Merrill 7159*, September, 1910; on leaves of *Vigna lutea*. LUZON, Province of Rizal, San Pedro Macati, *Merrill 7475*, March, 1911; on leaves of *Vigna sesquipedalis*.

UROMYCES HEWITTIAE Syd.

LUZON, Province of Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 772*, January 30, 1913. Aecidium stage on leaves of *Hewittia sp.*

UROMYCES MUCUNAE Rabh.

LUZON, Manila, *Merrill S 83*, April, 1909. On leaves of *Mucuna lyonii*.

UROMYCES MALLOTI P. Henn.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 637*, January 7, 1913. Uredinial stage on leaves of *Mallotus moluccanus*.

UROMYCES LINEARIS B. & Br.

LUZON, Manila and vicinity, *Merrill 7463*, January, February, 1911; *Merrill 8379*, March, 1912: Province of Laguna, Los Baños, *C. F. Baker 774*, January 30, 1913. On leaves of *Panicum repens*.

PUCCINIA Persoon

PUCCINIA CONGESTA B. & Br.

LUZON, Province of Rizal, San Pedro Macati, *Merrill 7476*, March, 1911, on leaves of *Polygonum tomentosum:* Subprovince of Benguet, *Merrill 7925*, May, 1911, on leaves of *Polygonum sp.*

PUCCINIA HETEROSPORA B. & C.

LUZON, Province of Laguna, Los Baños, *Merrill S 134*, December, 1912. On leaves of *Sida javensis*.

PUCCINIA PHILIPPINENSIS Syd. sp. nov.

Soris uredosporiferis hypophyllis, sparsis, epidermide diutius tectis, usque 1 mm longis, cinnamomeo-brunneis; uredosporis globosis vel subglobosis, rarius late ellipsoideis, minute breviterque echinulatis, flavo-brunneis, 13 ad 18 μ diam., episporio 1.5 ad 2 μ crasso, poris germinationis duobus praeditis; soris teleutosporiferis hypophyllis, sparsis, usque 1 mm longis, tandem nudis, atris; teleutosporis oblongo-clavatis vel clavatis, apice rotundatis, truncatis vel acutiusculis, vix vel modice incrassatis (usque 7 μ), medio parum constrictis, basi plerumque attenuatis, flavidis usque brunneolis, 35 ad 50 μ longis, 12 ad 16 μ latis, pedicello brevissimo; paraphysibus numerosis, coalitis.

LUZON, Manila, *Merrill S 38*, September 7, 1912, on leaves of *Cyperus polystachyus* (*Pycreus odoratus*): Province of Laguna, Los Baños, *C. F. Baker 636*, January 7, 1913, on *Cyperus rotundus*.

The uredo-stage of this species has formerly been described as *Uredo philippinensis* Syd.[1] The species is related to *Puccinia Romagnoliana* Maire & Sacc., but differs by the smaller uredospores and teleutospores.

PUCCINIA ROMAGNOLIANA Maire & Sacc.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 657*, January 10, 1913. On leaves of *Cyperus iria.*

PUCCINIA MERRILLII P. Henn.

LUZON, Province of Bataan, Mount Mariveles, *P. W. Graff*, comm. *Merrill S 85*, November 3–17, 1912. On leaves of *Smilax bracteata.*

HEMILEIA Berkeley & Broome

HEMILEIA CANTHII B. & Br.

LUZON, Manila and vicinity, *Merrill 7470*, January, February, 1911. On leaves of *Plectronia* (*Canthium*) *peduncularis.*

AECIDIUM Persoon

AECIDIUM BLUMEAE P. Henn.

LUZON, Manila and vicinity, *Merrill 7466*, January, February, 1911. On leaves of *Blumea laciniata.*

AECIDIUM CLERODENDRI P. Henn.

LUZON, Province of Laguna, San Pablo to Nagcarlan, *Merrill 7484*, February, 1911, on leaves of *Clerodendron fragrans;* Los Baños, *C. F. Baker 740*, January 20, 1913, on leaves of *Clerodendron sp.:* Province of Rizal, vicinity of Manila, *P. W. Graff*, comm. *Merrill S 37*, September 22, 1912, on *Clerodendron intermedium.*

AECIDIUM KAERNBACHII P. Henn.

LUZON, Province of Laguna, San Pablo to Nagcarlan, *Merrill 7485*, February, 1911, on leaves of *Lepistemon flavescens:* Province of Bataan, Mount Mariveles, *P. W. Graff*, comm. *Merrill S 86*, November 3–17, 1912, on *Merremia vitifolia.*

UREDO Persoon

UREDO PREMNAE Koord.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 15982 Graff*, February 23–28, 1912. On leaves of *Premna cumingiana.*

UREDO DESMIUM (E. & Br.) Petch.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 325*, October 20, 1912. On leaves of *Gossypium sp.*

UREDO ABRI P. Henn.

LUZON, vicinity of Manila, *Merrill S 97*, December 7, 1912. On leaves of *Abrus precatorius.*

UREDO DIOSCOREAE-ALATAE Rac.

LUZON, vicinity of Manila, *P. W. Graff*, comm. *Merrill S 91*, December 2, 1912. On leaves of *Dioscorea alata.*

[1] Ann. Myc. 4 (1906) 32.

PHYLLACTINIA Léveille

PHYLLACTINIA SUFFULTA (Rebent.) Sacc.

LUZON, vicinity of Manila, *P. W. Graff*, comm. *Merrill S 35*, September 27, 1912. On leaves of *Morus alba*.

MELIOLA Fries

MELIOLA INTRICATA Syd. sp. nov.

Amphigena vel culmicola, maculas orbiculares vel oblongas 2 ad 8 cm longas sparsas vel confluentes atras formans; mycelio ex hyphis densissime intertextis et rete fere continuum efformantibus ramosis septatis fuscis 7 ad 11 μ latis composito; hyphopodiis capitatis numerosissimis, alternantibus, 18 ad 26 μ longis, rectis vel curvatis, cellula superiore 10 ad 14 μ crassa rotundata vel parum lobato-incisa, inferiore 4 ad 8 μ longa 5 ad 7 μ lata; setis mycelicis numerosis, rigidis, erectis vel basi abrupte geniculatis, atris, opacis, apice acutiusculis, 500 ad 800 μ longis, 12 ad 17 μ crassis; peritheciis paucis in quaque macula, globosis, 150 ad 200 μ diam., atris, tuberculatis; ascis late ovatis, 2- ad 4-sporis, mox evanescentibus; sporidiis oblongis, 4-septatis, leniter constrictis, utrinque obtusis, fuscis, 32 ad 38 μ longis, 11 ad 12 μ latis.

LUZON, Manila, *Merrill 7152*, August, 1910. On leaves and culms of *Scirpus grossus*.

The densely interwoven threads of the mycelium provided with very numerous hyphopodia and the thick setae are characteristic of this species.

MELIOLA DICHOTOMA B. & C.

NEGROS, Cabancalan, *Merrill 6767*, March, 1910. On leaves of *Phragmites karka*.

MELIOLA JASMINICOLA P. Henn.

LUZON, Manila and vicinity, *Merrill 7469*, January, February, 1911. On leaves of *Jasminum sambac*.

MELIOLA MANGIFERAE Earle.

Mycelio hypophyllo, maculiformi, maculas atras 2 ad 10 mm diam. efformante, modice evoluto, saepe etiam leniter effuso, ex hyphis ramosis dense intertextis atro-brunneis opacis 8 ad 11 μ crassis anastomosantibus composito; hyphopodiis mucronatis numerosis, alternantibus vel oppositis, 25 ad 30 μ longis, 2 ad 9 μ crassis; hyphopodiis capitatis rarioribus, variabilibus bicellularibus, rectis vel varie irregulariterque curvatis, 18 ad 24 μ longis, 10 ad 12 μ latis; setis mycelicis numerosissimis, 550 ad 720 μ longis, basi 9 ad 10 μ crassis, erectis, rigidis, atris, opacis, rarius apicem versus dilutioribus, diformibus, aliis simplicibus apice obtusulis, aliis ad apicem breviter 2- ad 4-furcatis; perithe-

ciis sparsis, globosis, 140 ad 160 μ diam., rugulosis, saepe collabentibus; ascis ovatis, 2- vel 3-sporis, fugacibus; sporidiis crasse ellipsoideo-oblongis, utrinque late rotundatis, 4-septatis, valde constrictis, 45 ad 50 μ longis, 19 ad 22 μ latis.

LUZON, Province of Rizal, Bosoboso, *M. Ramos*, comm. *Merrill S 112*, October, 1912. On the lower surface of languishing leaves of *Mangifera indica*.

The broad sporidia and moreover the very numerous, long, biformed setae are characteristic for this species. The above description has been drawn after the Philippine specimens. These agree perfectly with the type from Porto Rico. We have nowhere seen a description of this species; perhaps it has not yet been published by the author.

MELIOLA SUBSTENOSPORA von Höhnel.

LUZON, Province of Rizal, Bosoboso, *M. Ramos*, comm. *Merrill S 120*, October, 1912. On leaves of *Rottboellia ophiuroides*.

DIMERINA Theissen

DIMERINA GRAFFII Syd. sp. nov.

In mycelio Meliolae parasitica; hyphis tenuibus, Meliolae mycelium ambientibus, olivaceo-fuscidulis vel viridulo-fuscidulis, ramosis, remote septatis, anastomosantibus, 1.5 ad 2.5 μ latis; peritheciis densiuscule dispositis, globosis, atris, astomis, glabris, levibus, 90 ad 130 μ diam., contextu firmo parenchymatico ex cellulis 7 ad 9 μ longis composito; ascis clavatis vel crasse cylindraceis, apice obtusis, sessilibus, filiformiter paraphysatis, 25 ad 35 μ longis, 12 ad 15 μ latis, octosporis; sporidiis distichis, oblongis, utrinque rotundatis, medio 1-septatis non vel vix constrictis, hyalino-viridulis, 10 ad 12 μ longis, 3 ad 3.5 μ latis, cellula superiore parum latiore.

LUZON, Province of Bataan, Limay, *P. W. Graff*, comm. *Merrill S 98*, November 3–19, 1912. On the mycelium of an undeterminable *Meliola* on the upper leaf-surface of *Gmelina philippensis*.

DIMEROSPORINA von Höhnel

DIMEROSPORINA PUSILLA Syd. sp. nov.

Epiphylla, sparsa, maculas minutissimas oblongas 1 ad 3 mm longas 0.1 ad 0.2 mm latas atras formans; subiculo superficiali, tenui, membranaceo, parce evoluto, celluloso, ubique setis numerosis erectis rigidis opacis obscure fuscis ad apicem obtusis leniterque dilatatis 2- vel 3-septatis 40 ad 55 μ longis 5 ad 8 μ latis obsito; peritheciis numerosis, globulosis vel globoso-obpiriformibus, 35 ad 60 μ altis, 25 ad 50 μ latis, basi late rotundatis et hypha brevissima suffultis, superne etiam rotundatis et primo clausis, tandem imperfecte ostiolatis, contextu tenaci olivaceo-fuligineo ex cellulis polygonalibus 5 ad 8 μ latis composito; ascis

pluribus (4 ad 8) in quoque perithecio, ovatis, antice crasse tunicatis, aparaphysatis, 20 ad 28 μ longis, 16 ad 20 μ latis, octosporis; sporidiis conglobatis, oblongis, utrinque rotundatis, medio vel circa medium 1-septatis, non vel vix constrictis, hyalinis, 15 ad 18 μ longis, 3.5 ad 4.5 μ latis.

POLILLO, Mount Malulud, *Bur. Sci. 9093 a Robinson*, August, 1909. On living leaves of *Lophatherum gracile*.

Although the subiculum is only very poorly developed, yet the fungus undoubtedly shows a close relationship to the genera *Dimerosporina* and *Balladyna*. We place it in the former genus, as there are more than one ascus in each perithecium.

EUTYPA Tulasne

EUTYPA BAMBUSINA Penz. & Sacc.

LUZON, Province of Bataan, Mount Mariveles, *P. W. Graff*, comm. *Merrill S 124*, November 3–19, 1912. On dead bamboo.

MYCOSPHAERELLA Johanson

MYCOSPHAERELLA PERICAMPYLI Syd. sp. nov.

Maculis distinctis, orbicularibus vel irregularibus, 1.25 ad 1.5 cm latis, centro demum exaridis, margine elevato purpureo cinctis; peritheciis numerosis in quaque macula, epiphyllis, applanato-globulosis, 60 ad 90 μ diam., poro circiter 15 ad 25 μ lato pertusis, atris, contextu subopaco fusco circa porum obscuriore indistincte parenchymatico; ascis cylindraceo-clavatis, fasciculatis, aparaphysatis, 35 ad 45 μ longis, 9 ad 13 μ latis, octosporis; sporidiis distichis, oblongo-fusoideis, rectis vel subrectis, utrinque obtusis, medio 1-septatis, non constrictis, hyalinis, 12 ad 15 μ longis, 3 ad 4 μ latis.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 16004 Graff*, February 23–28, 1912; Los Baños, *C. F. Baker 638*, January 7, 1913. On living or languishing leaves of *Pericampylus incanus*.

MYCOSPHAERELLA ROUREAE Syd. sp. nov.

Maculis distinctissimis, irregularibus, 2 ad 10 mm diam., in epiphyllo albidis vel albo-griseolis, in hypophyllo sordide ochraceo-brunneis, saepe angulatis; peritheciis epiphyllis, sparsis, minutis, atris, tectis, 70 ad 100 μ diam., poro pertusis, contextu parenchymatico fuscidulo; ascis fasciculatis, aparaphysatis, clavato-saccatis, 35 ad 40 μ longis, 10 ad 14 μ latis, octosporis; sporidiis distichis vel tristichis, elongato-oblongis, circa medium 1-septatis, non constrictis, hyalinis, 15 ad 18 μ longis, 3 ad 3.5 μ latis.

LUZON, Province of Bataan, near shore, between Limay and Lamao, *P. W. Graff*, comm. *Merrill S 101*, November 3–19, 1912. On leaves of *Rourea erecta*.

MYCOSPHAERELLA ALOCASIAE Syd.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 16019 Graff*, February 23–28, 1912. On leaves of *Alocasia sp.* NEGROS, Cabancalan, *Merrill 6770*, March, 1911, on leaves of *Alocasia macrorrhiza.*

MYCOSPHAERELLA CREBERRIMA Penz. & Sacc.

LUZON, Province of Laguna, Los Baños, *For. Bur. 19654 Foxworthy*, December 28, 1911. On languishing leaves of *Erythropalum scandens.*

DIDYMOSPHAERIA Fuckel

DIDYMOSPHAERIA STRIATULA Penz. & Sacc.

LUZON, Province of Rizal, Antipolo, *M. Ramos*, comm. *Merrill S 71*, October 19, 1912. On dead *Bambusa sp.*

PLEOSPHAERULINA Passerini

PLEOSPHAERULINA PHASEOLI Syd. sp. nov.

Maculis amphigenis, irregularibus, 0.3 ad 2 cm longis, arescentibus; peritheciis epiphyllis, sparsis, immersis, dein erumpentibus, lenticulari-globosis, 85 ad 130 μ diam., poro 25 ad 35 μ lato pertusis, membranaceis, atris, contextu pallide fuligineo; ascis saccatis, sessilibus, apice rotundatis, 85 ad 110 μ longis, 20 ad 35 μ latis, octosporis, aparaphysatis; sporidiis distichis, oblongis, utrinque obtusis, transverse 3- vel saepius 4-septatis, non vel vix constrictis, cellulis 2 vel 3 mediis septo uno longitudinali vel obliquo percursis, hyalinis, 24 ad 28 μ longis, 8 ad 10 μ latis.

LUZON, Manila, *P. W. Graff*, comm. *Merrill S 52*, September 9, 1912. On living leaves of *Phaseolus semierectus.*

TEPHROSTICTA (Sacc. & Syd.) Syd. genus novum

TEPHROSTICTA FICINA Syd. sp. nov.

Subiculo tenuissimo, epiphyllo, late effuso, totam folii superficiem plerumque occupante, haud maculiformi, nigro-cinereo, ex hyphis longiusculis subhyalinis usque fuscidulis crebre septatis 4 ad 7 μ crassis ad septa dein plus minus constrictis et moniliformibus tandem in articula secedentibus composito; peritheciis in subiculo aequaliter dispersis, superficialibus, globoso-hemisphaericis, mox collapsis, nigris, glabris, levibus, 140 ad 190 μ diam., apice poro rotundo minutissimo epapillato pertusis, 8 ad 10 μ diam. composito; ascis fasciculatis, clavatis, sessilibus, apice rotundatis et crasse tunicatis, 50 ad 65 μ longis, 17 ad 22 μ latis, aparaphysatis, octosporis; sporidiis distichis, ellipsoideo-oblongis, utrinque late rotundatis, horizontaliter 5- ad 7-septatis,

loculis paucis vel omnibus longitudinaliter vel oblique 1- vel 2-septatis, hyalinis, 28 ad 35 μ longis, 10 ad 13 μ latis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 570*, January 7, 1913. On living leaves of *Ficus ulmifolia*.

Tephrosticta Sacc. & Syd. was published in Ann. Myc. 2 (1904) 162 as a subgenus for *Teichosporella Negeriana* Sacc. & Syd. We now believe that it is certainly worthy of generic rank, differing too much from *Teichosporella* by the presence of a subiculum, by the collapsing perithecia, the lack of paraphyses, the growth on living or languishing leaves, etc. *Tephrosticta* Sacc. & Syd. is accordingly raised herewith to the status of a genus.

OPHIOBOLUS Riess

OPHIOBOLUS SERIATUS Syd. sp. nov.

Peritheciis aggregatis vel saepius bene seriatis, matrice inflatula diu omnino tectis, e mutua pressione irregularibus, atris, 300 ad 450 μ diam., glabris, levibus, ostiolo matricem inflatulam vix punctiformi-perforante; ascis cylindraceo-clavatis, brevissime stipitatis, apice rotundatis vel leniter attenuatis, 90 ad 110 μ longis, 8 ad 13 μ latis, octosporis; sporidiis elongato-fusoideis, utrinque attenuatis, continuis, sed pluriguttulatis, hyalinis, 55 ad 75 μ longis, 3 ad 4 μ latis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 663*, January 10, 1913. On dead culms of *Bambusa*.

The species is similar in habit to *Ophiobolus javanicus* Penz. & Sacc., but differs especially by its much longer asci and sporidia.

ANTHOSTOMELLA Saccardo

ANTHOSTOMELLA CALOCARPA Syd. sp. nov.

Sparsa vel aggregata, subinde confluens; pseudostromate orbiculari vel elliptico, 600 ad 1,000 μ longo, nitido, aterrimo; perithecio singulo in quoque pseudostromate, globuloso, papillato, 300 ad 400 μ diam.; ascis clavatis, apice rotundatis, 110 ad 130 μ longis, 16 ad 21 μ latis, filiformiter paraphysatis, octosporis; sporidiis monostichis usque subdistichis, ellipsoideis, continuis, utrinque rotundatis, primo hyalinis, mox amoene intenseque luteo-brunneis, 22 ad 26 μ longis, 11 ad 13 μ latis, membrana crassiuscula (2 ad 3 μ).

LUZON, Manila, *Merrill S 55*, October 7, 1912. On dead sheathing bases of leaves of *Pandanus tectorius*.

In Hedwigia 47 (1908) 263, Hennings has described a *Sphaeropsis Pandani* on leaves of *Pandanus laevis* from Davao, Mindanao. We have examined Hennings' original material, and have found that it contains two different fungi, both *Ascomycetes*, namely *Linospora Pandani* Syd. and *Anthostomella calocarpa* Syd. Hennings, when describing the above-mentioned *Sphaeropsis*, overlooked the asci. Such a fungus as Hennings

described, therefore, does not exist. The spores of his *Sphaeropsis* are in reality the ascospores of our *Anthostomella*. As there still exists an *Anthostomella Pandani* (Rabh.) Sacc., from India, the specific name *Pandani* of Hennings cannot be maintained for our species. The Indian fungus, of which we have seen the type, in Rabenhorst's Fung. eur. no. 2338 differs widely by much smaller perithecia and sporidia.

ROSELLINA DeNotaris

ROSELLINIA LAMPROSTOMA Syd. sp. nov.

Peritheciis sparsis vel laxe gregariis, superficialibus, levibus, glabris, e basi lata conoideis, atris, opacis, nitide papillatis, basi 0.75 ad 1 mm latis, 0.75 ad 1.25 mm altis, subiculo nullo; ascis cylindraceis, breviter stipitatis, 150 ad 200 μ longis, 15 ad 17 μ latis, octosporis; paraphysibus non visis; sporidiis oblique monostichis, oblongo-fusoideis vel naviculiformibus, utrinque acutis, fuligineis, continuis, 38 ad 52 μ longis, 8 ad 12 μ latis.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 15966 Graff*, February, 1912. On dead branches.

The species comes near *Rosellinia decipiens* Penz. & Sacc., especially in the form and size of the sporidia, but differs by the conical, not globose perithecia.

ROSELLINIA BAMBUSAE P. Henn.

LUZON, Province of Bataan, Mount Mariveles, *P. W. Graff*, comm. *Merrill S 125*, November 3–19, 1912. On dead climbing bamboo.

ROSELLINIA COCOES P. Henn.

LUZON, Province of Laguna, Mount Maquiling, *P. W. Graff*, comm. *Merrill S 28*, February 22, 1912. On dead *Calamus sp.*

NUMMULARIA Tulasne

NUMMULARIA ANTHRACODES (Fr.) Mont.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 15937 Graff*, February 23–28, 1912. On dead bark.

HYPOXYLON Bulliard

HYPOXYLON STYGIUM (Lév.) Sacc.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 15955 Graff*, February 23–28, 1912. On dead bark.

HYPOXYLON ANNULATUM (Schw.) Mont.

LUZON, Province of Bataan, Mount Mariveles, *Merrill 7624*, March, 1911. MINDANAO, Subprovince of Butuan, *C. M. Weber 1233*, March–July, 1911. On dead bark.

HYPOXYLON MARGINATUM (Schw.) Berk.

MINDANAO, Subprovince of Butuan, *C. M. Weber 1231*, March–July, 1911. On bark.

XYLARIA Hill

XYLARIA ANISOPLEURA Mont., forma.

LUZON, Province of Nueva Vizcaya, vicinity of Dupax, *Bur. Sci. 14352 McGregor*, March, April, 1912.

XYLARIA GRACILENTA Syd.

LUZON, Province of Laguna, Mount Banajao, *Merrill 7539*, February, 1911. On sticks.

KRETZSCHMARIA Fries

KRETZSCHMARIA GOMPHOIDEA Penz. & Sacc.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 15949 Graff*, February 23–28, 1912. On dead bark.

AMPHISPHAERIA Cesati & DeNotaris

AMPHISPHAERIA BAMBUSINA Syd. sp. nov.

Peritheciis solitariis vel binis, trinis aut quaternis seriatim dispositis, applanato-globulosis, primitus immersis, dein plus minus erumpentibus et laciniis matricis ruptae semper cinctis, levibus, atris, papilla obtusa nitidula instructis, 700 ad 1,000 μ diam., carbonaceis, pariete circa 70 ad 100 μ crasso; ascis clavatis, apice rotundatis, breviter stipitatis, 170 ad 210 μ longis, 20 ad 30 μ latis, octosporis; paraphysibus numerosissimis, dense stipitatis, hyalinis, 1 ad 1.5 μ latis; sporidiis monostichis vel oblique monostichis, ellipsoideis vel ellipsoideo-oblongis, utrinque late rotundatis, medio 1-septatis et constrictis, obscure castaneo-brunneis, 32 ad 36 μ longis, 15 ad 17 μ latis.

LUZON, Province of Bataan, Limay, *P. W. Graff*, comm. *Merrill S 127*, November 3–19, 1912. On dead culms of bamboo.

LORANTHOMYCES von Höhnel

LORANTHOMYCES SORDIDULUS (Lév.) von Höhnel.

LUZON, Subprovince of Bontoc, *Vanoverbergh 1067*, June, July, 1911, on leaves of *Loranthus sp.:* Subprovince of Benguet, *Merrill 7915*, May, 1911, on *Loranthus sp.:* Province of Rizal, Antipolo, *M. Ramos*, comm. *Merrill S 114*, October, 1912, on *Loranthus Haenkeanus*.

MEGALONECTRIA Spegazzini

MEGALONECTRIA PSEUDOTRICHIA (Schw.) Speg.

MINDANAO, District of Davao, *C. M. Weber s. n.*, September, October, 1911. On dead bark.

HYPOCREA Fries

HYPOCREA DEGENERANS Syd. sp. nov.

Stromatibus sparsis vel aggregatis, primitus immersis, dein erumpenti-superficialibus, discoideo-pulvinatis, rotundatis, semper convexis, matrici omnino lateque adnatis, 1 ad 2 mm diam.,

extus atro-brunneis vel atris, intus vivide flavo-virentibus, ostiolis peritheciorum non vel vix punctatis; peritheciis distichis usque tristichis, globoso-conicis; ascis lineari-cylindraceis, parte sporifera 60 ad 85 μ longa, 4.5 ad 6 μ crassis, octosporis; sporidiis biglobosis, hyalinis, levibus, intra ascos jam secedentibus, articulis 4 ad 4.5 μ diam.

INDO-CHINA, Annam, Nha-trang, *C. B. Robinson 1410*, March, 1911. On dead bark.

The species differs from others of the genus by the stromata, which are not superficial from the beginning, but at first immersed. At first sight the fungus looks like a *Diatrype*.

HYSTEROSTOMELLA Spegazzini

HYSTEROSTOMELLA PSYCHOTRIAE Syd. sp. nov.

Stromatibus hypophyllis, plerumque plus minus dense aggregatis, subinde 1–2 confluentibus, plerumque rotundatis, 0.5 ad 1.25 mm diam., atris, opacis, superficialibus, planis, membranaceis, facile secedentibus, centro plerumque tuberculo minuto punctiformi praeditis, marginem versus irregulariter radiatim contextis ibique ex hyphis dense connatis fuscis 2 ad 3 μ crassis compositis; loculis irregulariter dehiscentibus, tandem late apertis; ascis clavatis, apice rotundatis, deorsum leniter attenuatis, subsessilibus, aparaphysatis, 32 ad 40 μ longis, 8 ad 10 μ latis, octosporis; sporidiis distichis, intra ascos tantum visis, 1-septatis, oblongis, circa 9 ad 12 μ longis, 3 ad 4 μ latis, fuscidulo-coerulescentibus, sed haud jam maturis.

LUZON, Province of Rizal, Antipolo, *M. Ramos*, comm. *Merrill S 78*, October 11, 1912. On living leaves of *Psychotria luçoniensis*.

It is a pity that the specimens are not quite mature. Although we have seen the sporidia only in the interior of the asci, yet we believe they are two-celled with a bluish tint. In habit, the fungus has the same appearance as *Hysterostomella Myrtacearum* Rehm. Perhaps the measurements of the sporidia must later be corrected when ripe material has been examined.

SCHIZOTHYRIUM Desmazières

SCHIZOTHYRIUM ACERIS (P. Henn. & Lindau) Pat.

LUZON, Subprovince of Benguet, *Merrill 7910*, May, 1911. On leaves of *Acer sp.*

ASTERINA Léveille

ASTERINA CASSIAE Syd. sp. nov.

Mycelio tenui, epiphyllo, maculiformi vel plus minus effuso, atro, ex hyphis tenuibus dilute fuscis dense ramosis 3 ad 4 μ crassis parce septatis (articulis longitudine variabilibus, mox 15 ad 20 μ, mox multo longioribus) composito; hyphopodiis haud numerosis, plerumque alternantibus, rarissime oppositis, con-

tinuis, erectis, fuscis, saepe varie lobatis, 9 ad 12 μ longis, 4 ad 5 μ latis; peritheciis dense aggregatis, rotundatis, 100 ad 140 μ diam., applanatis, stellatim dehiscentibus, tenuibus, contextu griseo-viridulo ex hyphis 2.5 ad 3 μ latis strato simplici radiato-contextis peripherice subinde hyphis paucis flexuosis brevibus fimbriatis; ascis ovato-globosis, aparaphysatis, 26 ad 34 μ longis, 22 ad 28 μ latis, octosporis; sporidiis oblongis, utrinque rotundatis, medio 1-septatis, non vel leniter constrictis, levibus, 16 ad 20 μ longis, 6 ad 7 μ latis, ex hyalino fuscis, loculis aequalibus; pycnidiis similibus copiose praesentibus, minoribus, 70 ad 90 μ diam.; conidiis continuis, semper angulatis, obscure olivaceo-fuscis, subopacis, 12 ad 14 μ diam.

LUZON, Province of Bataan, Limay, *P. W. Graff*, comm. *Merrill S 90*, November 3–17, 1912. On living leaves of *Cassia timoriensis*.

ASTERINA ELMERI Syd.

LUZON, Province of Nueva Vizcaya, vicinity of Dupax, *Bur. Sci. 14363 McGregor*, March, April, 1912: Province of Rizal, Bosoboso, *M. Ramos*, comm. *Merrill S 113*, October, 1912; Antipolo, *M. Ramos*, comm. *Merrill S 64*, October 18, 1912. On leaves of *Champereia manillana* (*C. cumingiana*).

ASTERINA SPONIAE Rac.

LUZON, Province of Rizal, Antipolo, *M. Ramos*, comm. *Merrill S 68*, October 20, 1912. On leaves of *Trema amboinensis*.

ASTERINA LAWSONIAE P. Henn. & E. Nym.

LUZON, Manila, *P. W. Graff*, comm. *Merrill S 42*, December 15, 1911. On leaves of *Lawsonia inermis*.

ASTERINA LAXIUSCULA Syd. sp. nov.

Mycelio epiphyllo, parce vel modice evoluto, tenui, laxo, effuso, ex hyphis castaneo-brunneis 4 ad 5 μ crassis ramosis remote septatis formato; hyphopodiis alternantibus, continuis, obtusis, rectis, crasse cylindraceis, 6 ad 10 μ longis, 4 ad 6 μ crassis, castaneis; peritheciis mox laxe sparsis, mox magis aggregatis, applanatis, rotundatis, extus atris, stellatim dehiscentibus, 150 ad 220 μ diam., contextu opaco ex hyphis fuscis 3 ad 4 μ crassis composito, ambitu parum vel modice fimbriatis; ascis ovatis, aparaphysatis, 55 ad 75 μ longis, 40 ad 50 μ latis, octosporis; sporidiis conglobatis, oblongis, utrinque late rotundatis, medio 1-septatis et constrictis, ex hyalino fuscis, levibus, 32 ad 40 μ longis, 15 ad 18 μ latis.

LUZON, Province of Bataan, Mount Mariveles, *Merrill 7620* (type), March, 1911, on living leaves of *Sideroxylon angustifolium*. MINDANAO, District of Zamboanga, Santa Cruz Island, *Merrill S 43*, December 4, 1911, on leaves of *Sideroxylon ferrugineum*.

PHYLLACHORA Nitzsche

PHYLLACHORA AFZELIAE Syd. sp. nov.

Stromatibus epiphyllis, sparsis, leniter prominulis, rotundatis, 0.5 ad 2 mm latis, nitidulis, atris, intus pluriloculatis, ob loculos prominulos leniter rugulosis; ascis clavatis, 50 ad 60 μ longis, 11 ad 14 μ latis, octosporis; sporidiis fusiformibus, utrinque acutis, continuis, hyalinis, 18 ad 24 μ longis, 4.5 ad 5.5 μ latis; stylosporis simul praesentibus filiformibus, varie curvis, continuis, hyalinis, tenuissimis, 17 ad 25 μ longis, 0.75 μ latis.

MINDANAO, District of Cotabato, *For. Bur. 18254 Miranda, For. Bur. 14238 Tarrosa,* May, June, 1912. On living leaves of *Afzelia (Intsia) bijuga.*

PHYLLACHORA DISCHIDIAE Syd. sp. nov.

Stromatibus in utraque foliorum pagina conspicuis, sparsis, rotundatis, 1 ad 2 mm diam., atris, opacis, planiusculis, sublevibus, loculos 12 ad 25 includentibus; ascis cylindraceis, apice obtusis, brevissime stipitatis, indistincte paraphysatis, 85 ad 105 μ longis, 9 ad 11 μ latis, octosporis; sporidiis distichis, fusiformibus, continuis, hyalinis, 24 ad 27 μ longis, 5 ad 6 μ latis.

LUZON, Province of Bataan, Mount Mariveles, *Merrill 7623,* March, 1911. On living leaves of *Dischidia rosea.*

PHYLLACHORA PAHUDIAE Syd. sp. nov.

Stromatibus epiphyllis, hypophyllo plus minus conspicuis, innatis, lenissime prominulis, in greges orbiculares 3 ad 10 mm diam. concentrice dispositis, minutis, rotundatis, 0.25 ad 0.5 mm diam., subinde confluentibus et majoribus, atris; ascis jam resorptis; sporidiis fusiformibus, utrinque attenuatis, continuis, hyalinis, 16 ad 19 μ longis, 3.5 ad 5 μ latis.

CEBU, *For. Bur. 19515 Cenabre,* December, 1910. On living leaves of *Pahudia rhomboidea.*

PHYLLACHORA ROUREAE Syd. sp. nov.

Stromatibus epiphyllis, in hypophyllo etiam visibilibus, zona circa 1 mm lata ochraceo-brunnea circumdatis, immersis, planis, haud prominulis, rotundatis, 1.5 ad 2.5 mm diam.; loculis 5 ad 10 in quoque stromate, minutis; stylosporis filiformibus, rectis vel leniter curvatis, uno fine saepe latioribus quam altero, hyalinis, continuis, 24 ad 46 μ longis, 1 ad 1.5 μ latis; ascis sporidiisque immaturis tantum visis.

LUZON, Province of Bataan, Mount Mariveles, *P. W. Graff,* comm. *Merrill S 103,* November 3–19, 1912. On living leaves of *Rourea erecta.*

PHYLLACHORA LAGUNENSIS Syd. sp. nov.

Maculis epiphyllis, rotundatis, fuscidulis, 3 ad 8 mm diam., leniter depressis; stromatibus hypophyllis, nunquam epiphyllis, in greges maculas oppositos densiuscule distributis, minutis, non vel vix confluentibus, 0.5 ad 1 mm diam., rotundatis, convexis, centro nitidis, intus paucilocularibus; ascis cylindraceo-clavatis, 60 ad 80 μ longis, 8 ad 12 μ latis, octosporis; sporidiis subglobosis vel late ellipsoideis, continuis, hyalinis, 9 ad 11 μ longis, 7 ad 9 μ latis.

LUZON, Province of Laguna, *For. Bur. 22286 a Mariano*, January, 1911. On living leaves of *Ficus Hauili.*

The new species comes near *Phyllachora apoensis* Syd., which also grows on the under leaf-surface. It differs, however, by the densely aggregated stromata and the smaller sporidia.

PHYLLACHORA FICI-FULVAE Koord.

LUZON, Subprovince of Benguet, *Merrill 7914*, May, 1911, on *Ficus validicaudata:* Province of Rizal, Montalban, *Merrill 6240, 6240 a*, November, 1908, on leaves of *Ficus odorata;* Antipolo, *M. Ramos*, comm. *Merrill S 116*, October, 1912, on leaves of *Ficus ulmifolia;* Manila and vicinity, *Merrill 7468*, January, February, 1911, on *Ficus ulmifolia:* Province of Laguna, San Pablo to Nagcarlan, *Merrill 7486*, February, 1911, on leaves of *Ficus odorata;* Mount Maquiling, *Bur. Sci. 15988 Graff*, February 23–28, 1912, on leaves of *Ficus ulmifolia.*

Many forms of *Phyllachora* have been found on different species of *Ficus* in the Philippines. All those listed above agree in the size and the irregular disposition of the stromata on the upper side of the leaves, and in the shape and size of the sporidia, 9 to 12 μ long and 6 to 9 μ broad. We consider all these forms to belong to a single but variable species. They agree fairly well with Koorders' *P. Fici-fulvae*, hence we have so named the specimens. However, some other species, such as *P. Kaernbachii* P. Henn. and *P. Fici-minahassae* P. Henn., seem not to differ from *P. Fici-fulvae*, and must very probably be united with Koorders' species. The oldest name, then, would be *P. Kaernbachii* P. Henn.

PHYLLACHORA ELMERI Syd.

MINDANAO, Subprovince of Butuan, *Bur. Sci. 15929 Fénix*, August, 1912. On leaves of *Ficus blepharostoma.*

PHYLLACHORA INFECTORIA Cke.

LUZON, Province of Laguna, Mount Maquiling, *Merrill 7622*, March, 1911. On leaves of *Ficus sp.*

PHYLLACHORA YAPENSIS (P. Henn.) Syd. comb. nov.

Dothidella yapensis P. Henn. in Hedwigia 41 (1902) Beibl. 64.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 14413 McGregor*, March, April, 1912, on leaves of *Derris sp.:* Province of Laguna, Mount Maquiling, *Bur. Sci. 15984, 15990 Graff*, February 23–28, 1912, on *Derris elliptica.*

We have compared these collections with the type of *Dothidella yapensis* P. Henn., and have found them to be identical. Hennings has stated that

the sporidia are bicellular. The type as well as the Philippine specimens, however, have only unicellular sporidia, which measure 7 to 12 μ in length and 4 to 5 μ in breadth. Hence the fungus must be placed in the genus *Phyllachora*.

PHYLLACHORA COICIS P. Henn.

LUZON, Manila, *Merrill S 57*, December, 1911. MINDANAO, Subprovince of Bukidnon, *Bur. Sci. 15793 Fénix*, August, 1912. On leaves of *Coix lacryma-jobi*.

PHYLLACHORA SORGHI von Höhnel.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 15979 Graff*, February 23–28, 1912. On leaves of *Andropogon halepensis*.

PHYLLACHORA SACCHARI-SPONTANEI Syd. sp. nov.

Stromatibus amphigenis, in utraque foliorum pagina conspicuis, maculis flavido-pallescentibus saepe rufo- vel sanguineo-marginatis insidentibus, saepe etiam sine maculis, sparsis vel paucis laxe seriatim dispositis, oblongis, 0.5 ad 1.75 mm longis, 0.33 ad 0.75 mm latis, carbonaceis, subopacis; loculis seriatim dispositis, minutis; ascis clavatis, subsessilibus vel breviter stipitatis, 75 ad 100 μ longis, 18 ad 22 μ latis, filiformiter paraphysatis; sporidiis distichis, fusiformibus, utrinque leniter attenuatis, continuis, hyalinis, intus minute guttulatis, 22 ad 27 μ longis, 7.5 ad 8.5 μ latis; stylosporis simul praesentibus breviter filiformibus, rectis vel leniter curvulis, hyalinis, 16 ad 22 μ longis, 0.75 ad 1 μ latis.

LUZON, near Manila, *Bur. Sci. 16075 Graff*, December 1, 1911. On leaves of *Saccharum spontaneum*.

The *Phyllachora* on *Saccharum spontaneum*, which is not rare in the Philippine Islands, has hitherto been regarded as the same as *P. Sacchari* P. Henn., found on *Saccharum officinarum*. It has, indeed, the same general appearance as the latter, but differs in the form of the sporidia. These are elliptic or ovate, broad, and measure 15 to 22 by 10 to 13 μ in *P. Sacchari*, whereas those of *P. Sacchari-spontanei* are longer but narrower, and fusiform in shape. We have examined two specimens of each form from different localities, and have found the difference in the shape and size of the sporidia to be constant. We do not hesitate, therefore, to regard the form on *S. spontaneum* as a distinct species.

PHYLLACHORA CYNODONTIS (Niessl) Sacc.

LUZON, Manila, and vicinity, *Merrill 8378*, March, 1912; *Merrill 7465*, January, February, 1911. On leaves of *Cynodon dactylon*.

PHYLLACHORA GRAMINIS (Pers.) Fuckel.

NEGROS, Cabancalan, *Merrill 6761*, March, 1911. On leaves of *Digitaria consanguinea*.

PHYLLACHORA STENOSPORA (B. & Br.) Sacc.

LUZON, Province of Laguna, Mount Maquiling, *Merrill S 133*, November, 1912. On leaves of *Panicum patens*.

PHYLLACHORA SHIRAIANA Syd.

LUZON, Province of Bataan, Mount Mariveles, *P. W. Graff*, comm. *Merrill S 108*, November 3–19, 1912. On leaves of *Schizostachyum acutiflorum*.

DOTHIDEA Fries

DOTHIDEA PTEROCARPI Syd. sp. nov.

Stromatibus epiphyllis, superficialibus, sparsis vel paucis aggregatis, rotundatis, hemisphaerico-pulvinatis, atris, opacis, 0.33 ad 1 mm diam., rugulosis; loculis paucis, 1 ad 5 in quoque stromate, majusculis; ascis cylindraceo-clavatis, apice obtusis, 48 ad 60 μ longis, 10 ad 16 μ latis, octosporis; sporidiis distichis, ovato-oblongis vel oblongis, valde inaequaliter 1-septatis, fusco-brunneis, 10 ad 13 μ longis, 5 ad 7 μ latis, cellula basali 3 ad 4 μ tantum longa.

CEBU, *For. Bur. 19514 Cenabre*, December, 1910. On languishing leaves of *Pterocarpus indicus*.

DOTHIDELLA Spegazzini

DOTHIDELLA ALBIZZIAE Syd. sp. nov.

Stromatibus epiphyllis, sparsis, rotundatis, minutissimis, 0.2 ad 0.5 mm diam., atris, intus plerumque 1-locularibus, raro 2-locularibus; ascis clavatis, apice rotundatis, 55 ad 75 μ longis, 14 ad 19 μ latis, octosporis; sporidiis oblique monostichis usque distichis, ellipsoideis, utrinque late rotundatis, medio 1-septatis et valde constrictis, primo hyalinis (tandem dilutissime fuscidulis ?), 12 ad 16 μ longis, 5 ad 6 μ latis.

LUZON, Province of Nueva Ecija, *For. Bur. 19513 Alvarez*, October, 1910. On living leaves of *Albizzia marginata*.

MUNKIELLA Spegazzini

MUNKIELLA MELASTOMATA von Höhnel.

LUZON, Province of Bataan, Mount Mariveles, *Merrill 7619*, March, 1911. On leaves of *Melastoma fuscum*.

Phyllachora aggregatula Syd., described in Ann. Myc. 8 (1910) 38, and living on the same host plant, must be united with Höhnel's *Munkiella melastomata*. The sporidia have a very small basal cell, which is easily overlooked.

RHYTISMA Fries

RHYTISMA LAGERSTROEMIAE Rabenh.

LUZON, Province of Rizal, *Bur. Sci. 12 Foxworthy*, January, 1906. On leaves of *Lagerstroemia speciosa*.

The fungus has been renamed *Rhytisma Lagerstroemiae* P. Hennings in Hedwigia 47 (1908) 262. Asci and sporidia of the fungus are not yet known.

PHYLLOSTICTA Persoon

PHYLLOSTICTA BAKERI Syd. sp. nov.

Maculis amphigenis, primitus irregularibus, angulatis, 3 ad 10 mm diam., dein plus minus confluentibus et magnam partem spatii inter nervos primarios occupantibus, albescentibus, linea elevata fusco-purpurea cinctis; pycnidiis epiphyllis, sparsis, immersis, minutissimis, atris, 60 ad 90 μ diam., poro vix conspicuo, contextu subopaco irregulariter parenchymatico; sporulis numerosissimis, exiguis, oblongis, 2 ad 2.5 μ longis, 1 μ latis, hyalinis; basidiis non visis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 628*, January 7, 1913. On languishing leaves of *Bauhinia malabarica.*

SEPTORIA Fries

SEPTORIA BAKERI Syd. sp. nov.

Maculis epiphyllis, orbicularibus vel irregularibus, parum marginatis, 3 ad 6 mm diam., sordide ochraceis; pycnidiis epiphyllis, sparsis, minutissimis, 50 ad 70 μ diam., obscure brunneis; sporulis filiformibus, 20 ad 30 μ longis, 1 μ latis, hyalinis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 633*, January 7, 1913. On living or languishing leaves of *Leucas sp.*

LASIODIPLODIA Ellis & Everhart

LASIODIPLODIA THEOBROMAE (Pat.) Griff. & Maubl.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 746*, January 20, 1913. On dead rinds of *Theobroma cacao.*

LASMENIA Spegazzini

LASMENIA FICINA Syd. sp. nov.

Stromatibus epiphyllis, innatis, rotundatis vel irregularibus, 0.75 ad 2 mm diam., phyllachoroideis, atris, nitidulis, superficie undulatis; loculis paucis vel usque 10 in quoque stromate, angulato-globulosis, nucleo fusco farctis; sporulis globuloso-discoideis, continuis, levibus, fuligineis, 7 ad 9 μ diam.

LUZON, Province of Laguna, Mount Banajao, *Bur. Sci. 9874 Robinson*, March 5–7, 1910. On living leaves of *Ficus disticha.*

The fungus undoubtedly belongs to a species of *Phyllachora.*

EPHELIS Fries

EPHELIS CARICINA Syd. sp. nov.

Stromate albido-griseo, effuso, spicas obtegente easque ex toto deformante, sclerotioideo; cupulis erumpentibus, circa 0.75 ad 1.25 mm diam., orbicularibus, griseolis; basidiis erectis, sub-

hyalinis, circa 100 μ longis; sporulis filiformi-fusoideis vel aciculariibus, continuis, hyalinis, minute guttulatis, utrinque acutis, 6 ad 13 μ longis, 1 μ latis.

NEGROS, Canlaon Volcano, *Merrill 6897*, April, 1910. On spikes of *Carex Rafflesiana.*

ASCHERSONIA Montagne

ASCHERSONIA NOVO-GUINEENSIS P. Henn.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 619*, January 7, 1913: Province of Rizal, Antipolo, *M. Ramos*, comm. *Merrill S 69*, October 15, 1912. On leaves of *Ficus ulmifolia.*

GLOEOSPORIUM Desmazières & Montagne

GLOEOSPORIUM VANILLAE Cke.

LUZON, Manila, *Merrill 7054*, November, 1909. On dead leaves of *Vanda sanderiana.*

GLOEOSPORIUM CANAVALIAE Syd. sp. nov.

Acervulis subcutaneis, tandem parum erumpentibus, plerumque densiuscule et aequaliter distributis, rotundatis vel irregularibus, 90 ad 130 μ longis, pallidis, obscurius marginatis; conidiis oblongis, utrinque obtusis, continuis, hyalinis, varie guttulatis, 15 ad 18 μ longis, 5.5 ad 8 μ latis; basidiis subnullis.

LUZON, near Manila, *Merrill S 96*, December 7, 1912. On dead stems of *Canavalia turgida.*

COLLETOTRICHUM Corda

COLLETOTRICHUM EUCHROUM Syd. sp. nov.

Acervulis epiphyllis, plerumque aggregatis, erumpentibus, minutissimis, 60 ad 90 μ diam., amoene roseis; setulis paucis in quoque acervulo, rigidis, 3- vel 4-septatis, fuscis, 45 ad 80 μ longis, 3 ad 4 μ crassis; conidiis irregulariter cylindraceis, rectis, utrinque obtusis, continuis, hyalinis, 14 ad 20 μ longis, 4 ad 5 μ latis; basidiis brevissimis.

LUZON, Province of Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 43*, September 2, 1912. On languishing leaves of *Euphorbia neriifolia.*

COLLETOTRICHUM PANDANI Syd. sp. nov.

Acervulis dense gregariis, plerumque apices foliorum longe lateque arescentes occupantibus, rotundatis vel ellipticis, fuscobrunneis, 60 ad 120 μ longis, ad marginem setulis paucis brunneis 25 ad 50 μ altis 2 ad 3 μ latis continuis vel 1-septatis obsitis; conidiis oblongo-cylindraceis, continuis, utrinque rotundatis, hyalinis, 14 ad 17 μ longis, 3.5 ad 4.5 μ latis; basidiis non visis.

LUZON, Manila, *Merrill S 33*, October 5, 1912. On younger leaves of *Pandanus Veitchii.*

COLLETOTRICHUM PAPAYAE (P. Henn.) Syd.

LUZON, Province of Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 692*, January 15, 1913. On dead petioles of *Carica Papaya*.

We place Hennings' *Gloeosporium Papayae*, from Brazil, in the genus *Colletotrichum*, as the fungus possesses straight or slightly curved, brown, continuous setae, which are 25 to 50 μ long and 3 to 4 μ in breadth. On the type material of Hennings nearly all the setae have fallen. On material from Florida as well as on the Philippine specmens, the setae are easily to be seen.

USTILAGINOIDEA Brefeld

USTILAGINOIDEA OCHRACEA P. Henn.

LUZON, Province of Rizal, Bosoboso, *M. Ramos*, comm. *Merrill S 111*. On *Panicum auritum*.

CONIOSPORIUM Link

CONIOSPORIUM CIRCUMSCISSUM (B. & Br.) Sacc.

LUZON, vicinity of Manila, *Merrill S 109*, December, 1912. On dead twigs of *Bambusa Blumeana*.

CONIOSPORIUM VINOSUM (B. & C.) Sacc.

NEGROS, Cabancalan, *Merrill 6759*, March, 1910. On dead culms of *Saccharum officinarum*.

CERCOSPORIDIUM Earle

CERCOSPORIDIUM HELLERI Earle.

LUZON, Manila and vicinity, *Merrill 7467*, January, February, 1911. On living leaves of *Sphenoclea zeylanica*.

CERCOSPORA Fresenius

CERCOSPORA PERSONATA (B. & C.) Ellis.

LUZON, Province of Laguna, Los Baños, *M. B. Raimundo*, comm. *C. F. Baker 78*, September 20, 1912. On leaves of *Arachis hypogaea*.

CERCOSPORA AMORPHOPHALLI P. Henn.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 322*, October 1, 1912. On leaves of *Amorphophallus campanulatus*.

CERCOSPORA GLIRICIDIAE Syd. sp. nov.

Maculis hypophyllis, irregularibus, saepe vix distinctis, roseolis; caespitulis epiphyllis, irregulariter distributis, saepe aggregatis, minutissimis, 50 ad 80 μ diam., atris; hyphis fasciculatis, e strato proligero oriundis, rectis, continuis vel raro 1- vel 2-septatis, simplicibus, pallidissime fuligineis, 20 ad 35 μ longis, circa 3 ad 3.5 μ crassis; conidiis anguste obclavatis, rectis, 5- ad 12-septatis, guttulatis, primo subhyalinis, tandem fuligineis, 40 ad 75 μ longis, 4 ad 5.5 μ crassis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 624*, January 7, 1913. On living leaves of *Gliricidia sepium*.

CERCOSPORA BAKERI Syd. sp. nov.

Maculis amphigenis, rotundatis, 4 ad 10 mm diam., flavo-brunneolis; caespitulis hypophyllis, gregariis, sed minutissimis et oculo nudo vix conspicuis, olivaceo-brunneis; hyphis fasciculatis, simplicibus vel parcissime ramosis, remote septatis, usque 250 μ longis, 3 ad 6 μ latis, dilute olivaceo-brunneis; conidiis cylindraceo-clavulatis, utrinque obtusis, 3- ad 5-septatis, 30 ad 50 μ longis, 5 ad 6 μ latis, dilute olivaceis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 719*, Janaury 20, 1913. On living leaves of *Clerodendron sp.*

CERCOSPORA BIOPHYTI Syd. sp. nov.

Caespitulis hypophyllis, densiuscule gregariis et plerumque totam foliolorum superficiem vel magnam eorum partem aequaliter obtegentibus, griseolis; hyphis fuscis, septatis, simplicibus, brevibus vel etiam longiusculis, circa 3 ad 3.5 μ crassis; conidiis cylindraceis, rectis vel leniter inaequilateris, utrinque obtusiš, 4- ad 7-septatis, fuscidulis, 28 ad 45 μ longis, 3 ad 4 μ latis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 617*, January 7, 1913. On living leaves of *Biophytum sensitivum.*

CERCOSPORA PANTOLEUCA Syd. sp. nov.

Maculis amphigenis, angulatis, nervulis limitatis, 2 ad 6 mm longis, albis, linea angusta fusco-purpurea parum elevata marginatis; caespitulis amphigenis, minutissimis, 30 ad 60 μ diam., dense gregariis, sed non confluentibus, atro-brunneis; hyphis fasciculatis, brevibus, dilute fuligineis, simplicibus, 10 ad 25 μ longis, 2 ad 2.5 μ crassis; conidiis teretibus vel anguste obclavatis, hyalinis, 3- ad 10-septatis, 30 ad 65 μ longis, 2 ad 3 μ latis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 625*, January 7, 1913. On living leaves of *Clitorea ternatea.*

CERCOSPORA LITSEAE-GLUTINOSAE Syd. sp. nov.

Maculis amphigenis, orbicularibus, 1 ad 3 mm diam., fuscidulis; caespitulis hypophyllis, solitariis vel paucis in quaque macula, minutissimis, atro-brunneis; hyphis non conspicuis, brevibus, fuscidulis; conidiis subcylindraceis, rectis vel leniter inaequilateris, 4- ad 8-septatis, fuscidulis, 35 ad 70 μ longis, 3 ad 4 μ latis.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 639*, January 7, 1913. On living leaves of *Litsea glutinosa.*

CERCOSPORA TOSENSIS P. Henn.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 634*, January 7, 1913. On leaves of *Solanum sp.*

CERCOSPORA UBI Rac.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 87*, September 16, 1912. On leaves of *Dioscorea sp.*

HELMINTHOSPORIUM Link

HELMINTHOSPORIUM RAVENELII B. & C.

LUZON, Subprovince of Benguet, *Merrill 7911*, May, 1911: Province of Rizal, Bosoboso, *M. Ramos*, comm. *Merrill S 117*, October, 1912. On spikes of *Sporobolus elongatus.*

HELMINTHOSPORIUM NODULOSUM B. & C.

LUZON, Province of Laguna, Los Baños, *C. F. Baker 688*, January 12, 1913. On spikes of *Eleusine indica.*

SPEGAZZINIA Saccardo

SPEGAZZINIA MELIOLAE A. Zimmerman.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 16000 Graff*, February 23–28, 1912. On *Meliola sp.* on leaves of *Triumfetta.*

CEREBELLA Cesati

CEREBELLA PASPALI Cke. & Mass.

LUZON, Benguet Subprovince, *Merrill 7913*, May, 1911. On *Paspalum scrobiculatum.*

HYMENOPSIS Saccardo

HYMENOPSIS CUDRANIAE Mass.

LUZON, Province of Bataan, Limay, *P. W. Graff*, comm. *Merrill S 94*, November 3–12, 1912. On leaves of *Cudrania javanensis.*

Errata

In "Descriptions of Some New Philippine Fungi," supra, page 196, line 10 from top, in place of *Derris sp.* (aff. *D. ellipticae* Benth.), *read Aglaonema densinervium* Engl.

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DAILY GROWTH MOVEMENTS OF LAGERSTROEMIA

By EDWIN BINGHAM COPELAND

(*From the College of Agriculture, University of the Philippines, Los Baños, P. I.*)

Curvatures due to growth, made and eliminated regularly in each twenty-four hour period, are well known as phenomena of the growth of the young leaves, or young flowering branches or shoots, of many plants. They have been most carefully and extensively studied by Darwin,[1] who called them "nyctitropic." Pfeffer, who also made a careful study of these movements, designated them as "nyctinastic," because, while they are caused by the succession of day and night, the direction of curvature is independent of the illumination. The only statement known to me as to the occurrence of nyctinastic curvatures in leafy branches is one in Pfeffer's Pflanzenphysiologie, ed. 2, **2**: 484, to the effect that they have been observed by Vöchting in the branches of *Mimulus Tilingii.*

What Vöchting reports[2] is not a movement of the ordinary vegetative branches, but of flowering branches which incidentally bear leaves: "Dieselben Vorgänge, die wir an der Hauptachse beobachten, finden sich wieder an den Seitengliedern, wenn diese Blütenstände bilden, und zwar sowohl an den kleineren, als an den grösseren." He made no real study of the cause of the movement, but says: "Doch glaube ich auf Grund einiger Beobachtungen annehmen zu dürfen, dass die fragliche Streckung theilweise auf dem Einflusse der Schwerkraft, theilweise und vielleicht hauptsächlich auf dem der Rectipetalität beruht." The temperature also is believed to be one of the controlling factors.

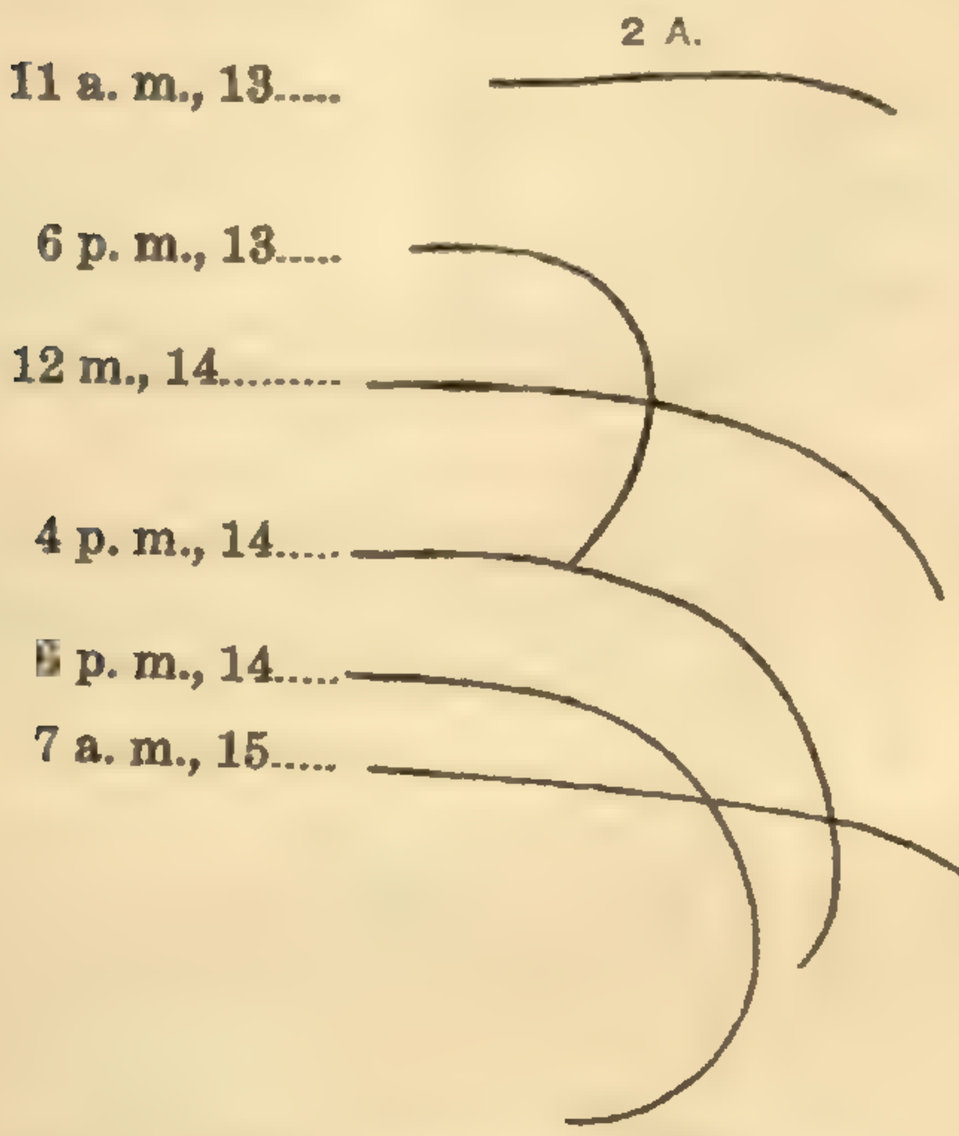
[1] Power of Movement in Plants, Chapters VI and VII.
[2] Berichte Deutsch. Bot. Ges. 16 (1898) 37.

Very conspicuous movements of the kind in question are shown by the young branches of *Lagerstroemia speciosa* (L) Pers., more commonly known as *L. Flos-Reginae*, a tree widespread in the Eastern Tropics wherever there are distinct wet and dry seasons, and commonly cultivated because of its gorgeous floral display. The tree is completely deciduous, at least under our conditions. Late in the dry season, but without waiting for the rains to begin, the buds begin to develop, springing from the axils of the leaves of the preceding season; no leaves are borne on the old wood. On each surviving branch of whatever order, the most distal bud assumes somewhat the character of an apical bud, those lower down giving rise to the season's lateral branches; the distinction is not sharp, the terminal and lateral twigs shading from one to the other. The lowest of the latter are usually rudimentary. The season's terminal shoot and the upper lateral branches may be expected to bear panicles of flowers, which the lower lateral branches as a rule do not. However, the growth of the latter is most definitely and peculiarly limited. After the due number of nodes have been formed and have grown out of the bud, and while the growth of the internodes and leaves is most rapid, growth in thickness stops abruptly at the last node which is to be permanent (for the season). Above this point, the shoot reaches a length of perhaps a centimeter, the leaves remain minute, and the exposed stem becomes hardly half a millimeter thick, while immediately below it the diameter may be four or five times as great. This stunted tip drops off before the growth below it is complete. Because of this blasting of the tip, the curve representing the growth of successive zones from the apex downward will be very peculiar if the chosen length of zones is very short.

All growing branches, the rudimentary basal ones in so far as they grow, the lateral ones whose growth is terminated by the loss of the tip, and the flowering apical ones, are alike in exhibiting marked daily movements. At the height of the season's growing period, these movements, carrying along the most of the foliage which has already developed, change the whole appearance of the tree. The petioles of the young leaves exhibit their own movements at the same time, but these have been reported upon sufficiently in the cases of other plants.

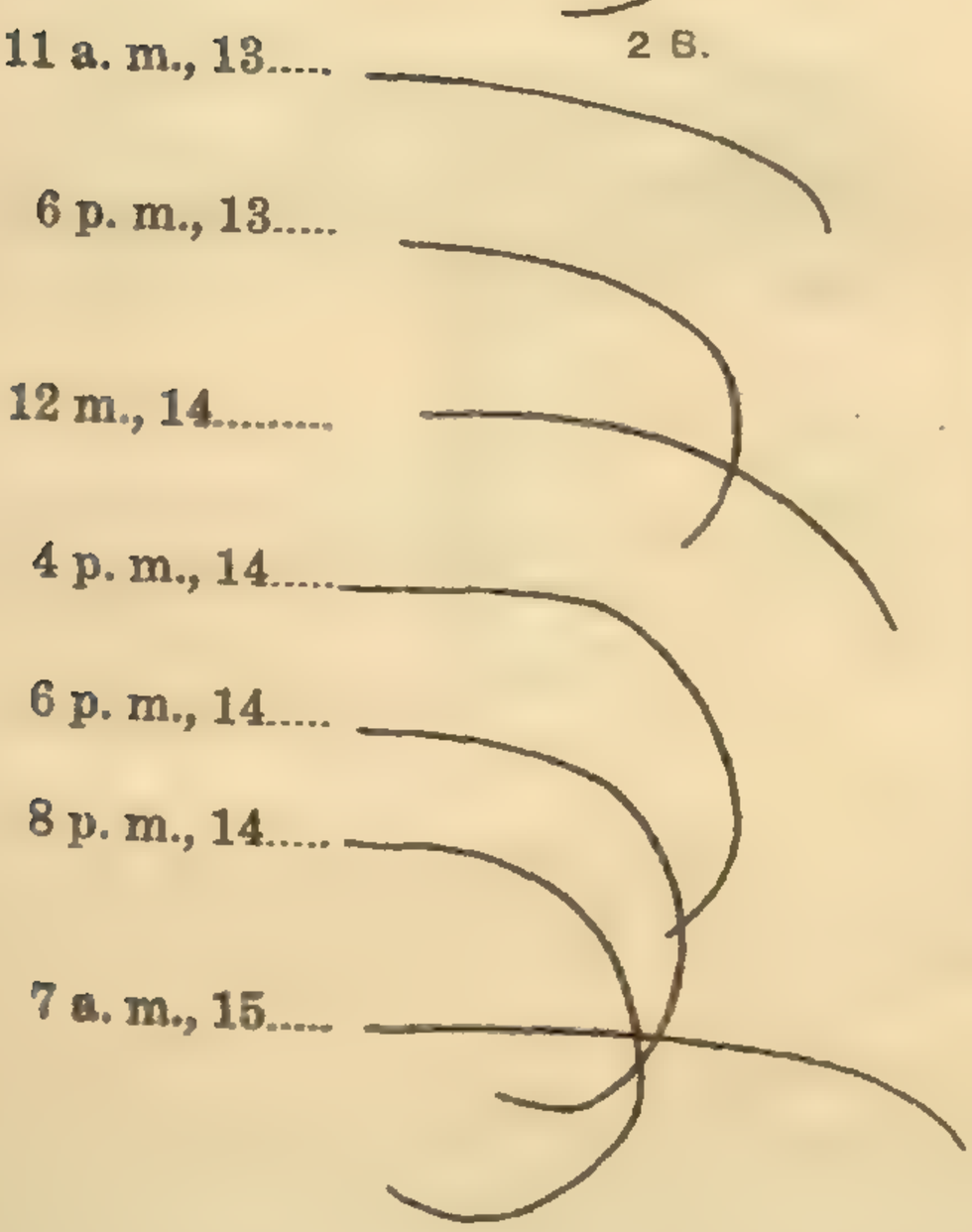
A tree of *Lagerstroemia* grows by the path between my office and residence so that I habitually pass it in the early morning, at noon, and in the evening. The difference in appearance at different hours during its period of rapid growth was so striking that on April 13 I began a study of its behavior. All of the twigs

on four small branches were marked off with India ink into zones each 5 mm long. At the same time the curvature of the branch was traced by projection against a piece of paper. This work began about 11 o'clock and took nearly two hours. At intervals during the following few days the curves were traced again in the same manner, and the growth by zones was measured twice. The behavior of the twigs on the different branches was essentially the same, so that it would be useless to publish observations on them all. The accompanying cuts show the curves of the twigs on branch No. 2 and the growth by zones up to 12 noon April 14, or during the first twenty-four hours. The cuts are reduced one half.



Length, 11 a. m., April 13, 5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

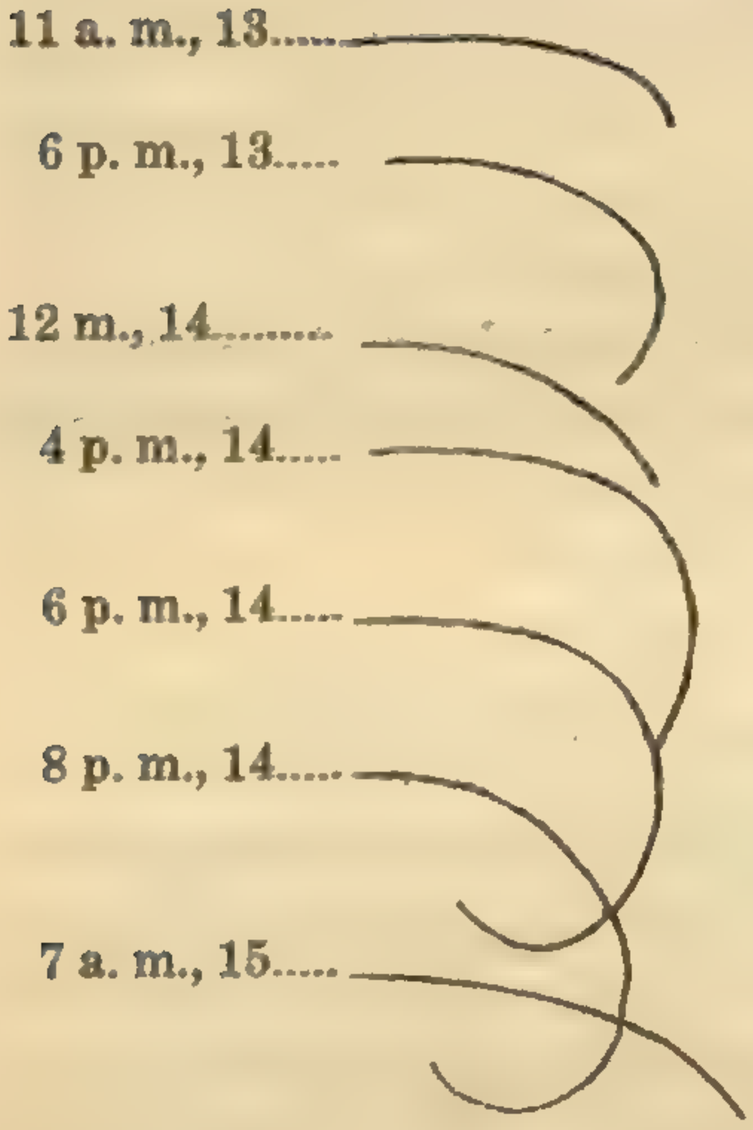
Zone.	Growth.
1	3.5
2	3.5
3	3.6
4	3.2
5	3.0
6	3.0
7	3.2
8	2.6
9	2.2
Total..	27.8, or 61.77 per cent.



Length, 11 a. m., April 13, 4.5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.	Growth.
1	4.0
2	4.0
3	5.0
4	4.0
5	3.3
6	3.0
7	3.6
8	3.0
Total..	29.9, or 74.75 per cent.

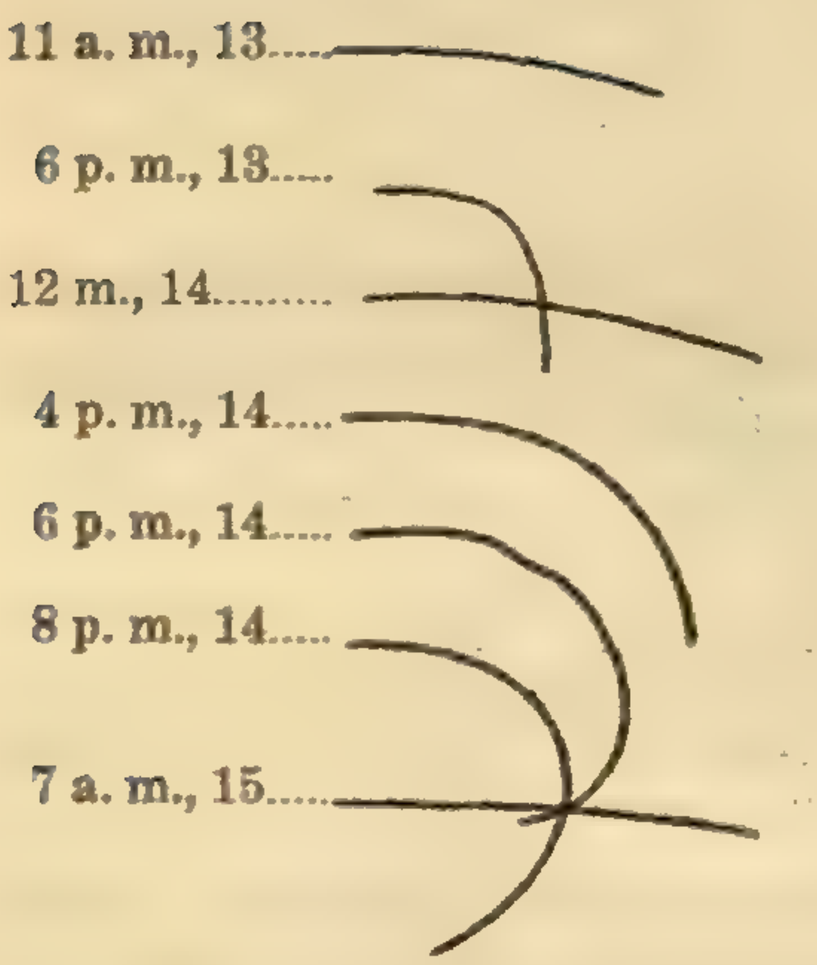
2 C.



Length, 11 a. m., April 13, 4.5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.	Growth.
1	2.5
2	4.0
3	3.7
4	3.0
5	3.2
6	3.5
7	3.2
8	3.0
Total..	26.1, or 61.25 per cent.

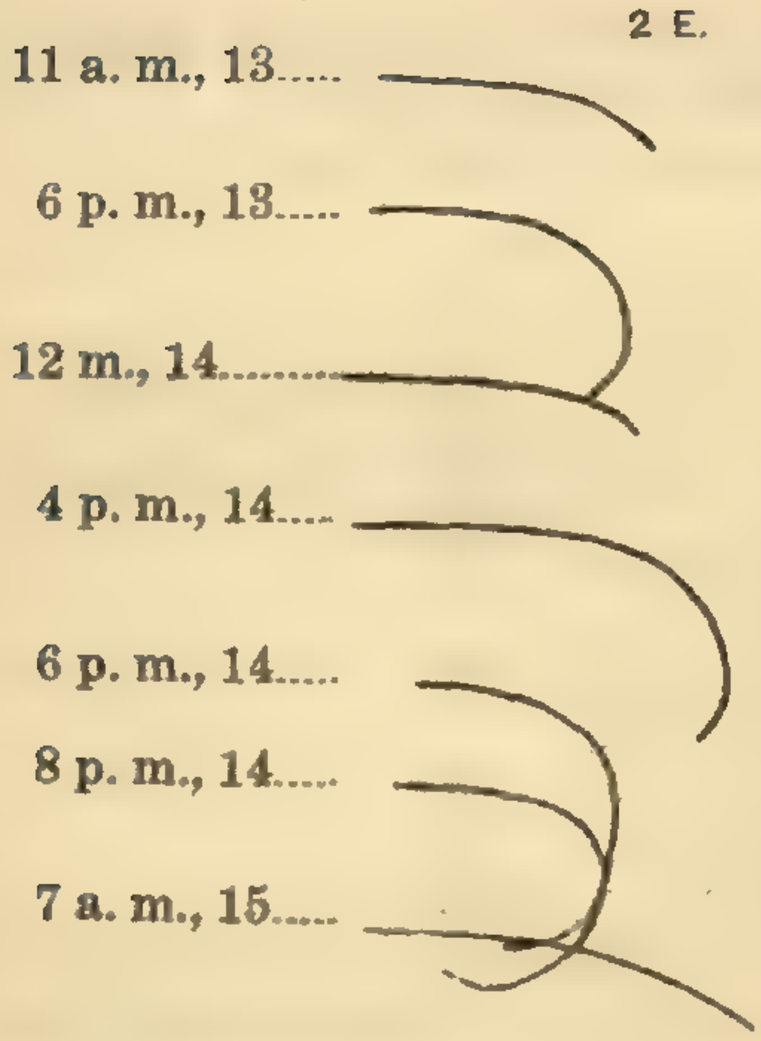
2 D.



Length, 11 a. m., April 13, 3.5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.	Growth.
1	3.5
2	4.0
3	4.0
4	3.0
5	3.5
6	3.0
7	2.5
Total..	23.5, or 67.14 per cent.

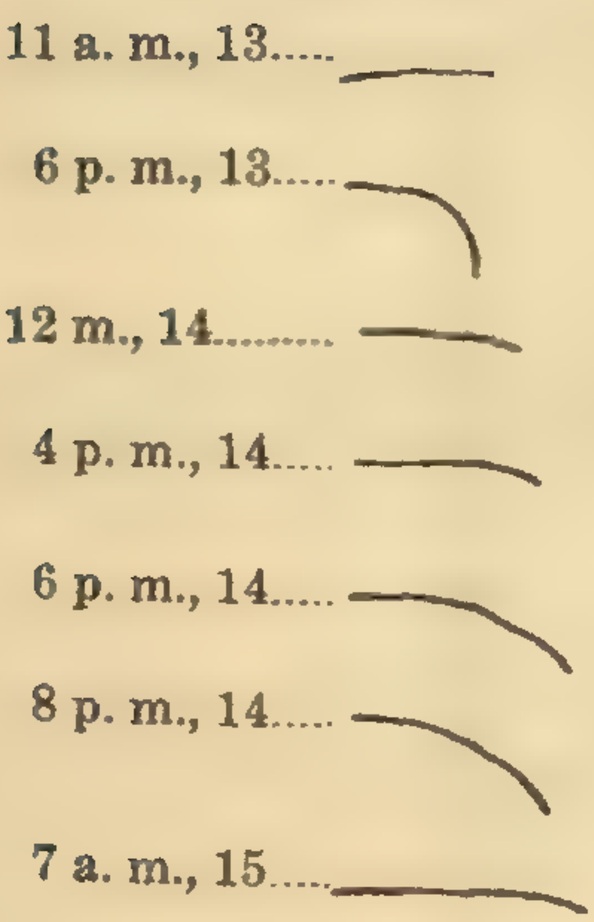
2 E.



Length, 11 a. m., April 13, 3.5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.	Growth.
1	2.0
2	2.0
3	3.5
4	4.0
5	2.7
6	3.0
Total..	17.2, or 57.33 per cent.

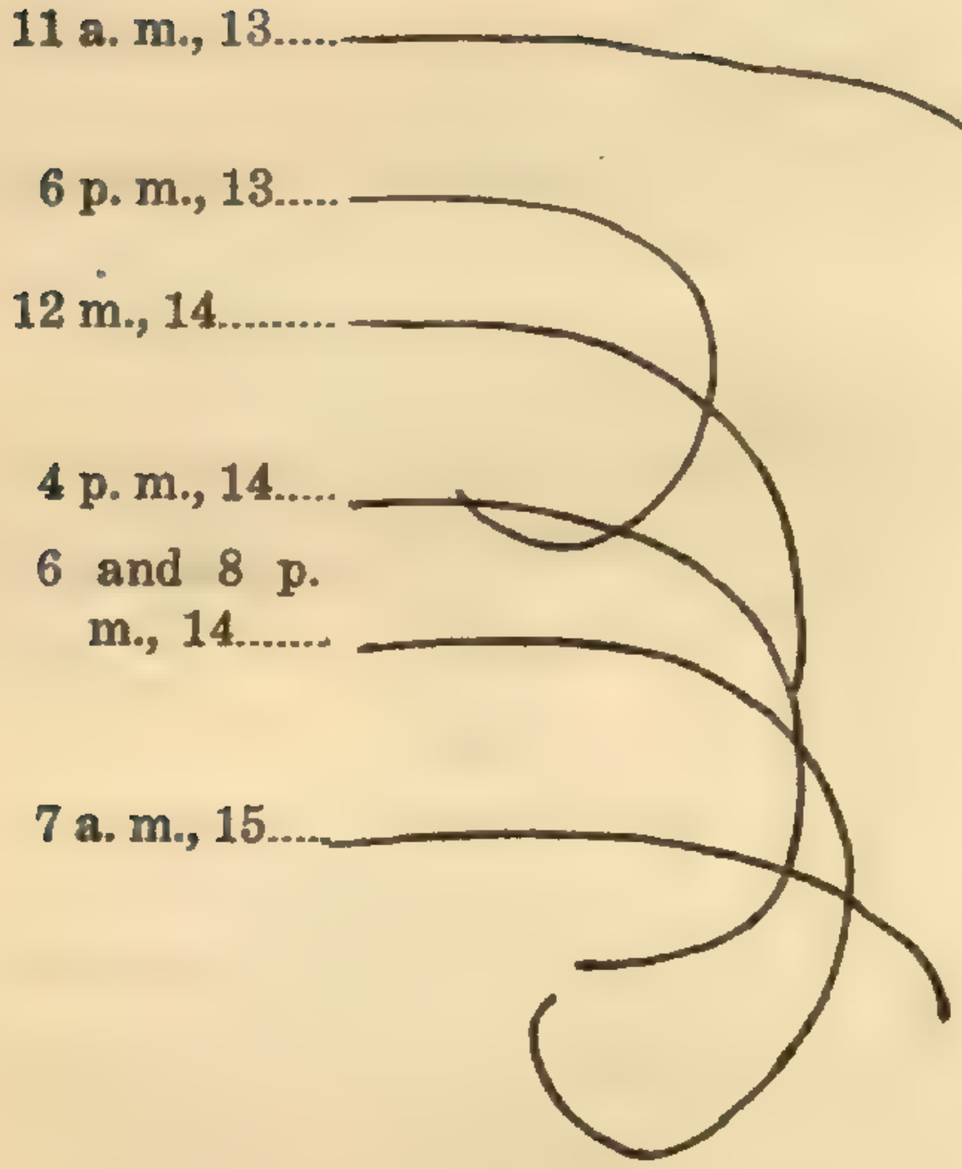
2 F.



Length, 11 a. m., April 13, 2 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.	Growth.
1	2.0
2	1.8
3	1.3
4	1.0
Total..	6.1, or 30.5 per cent.

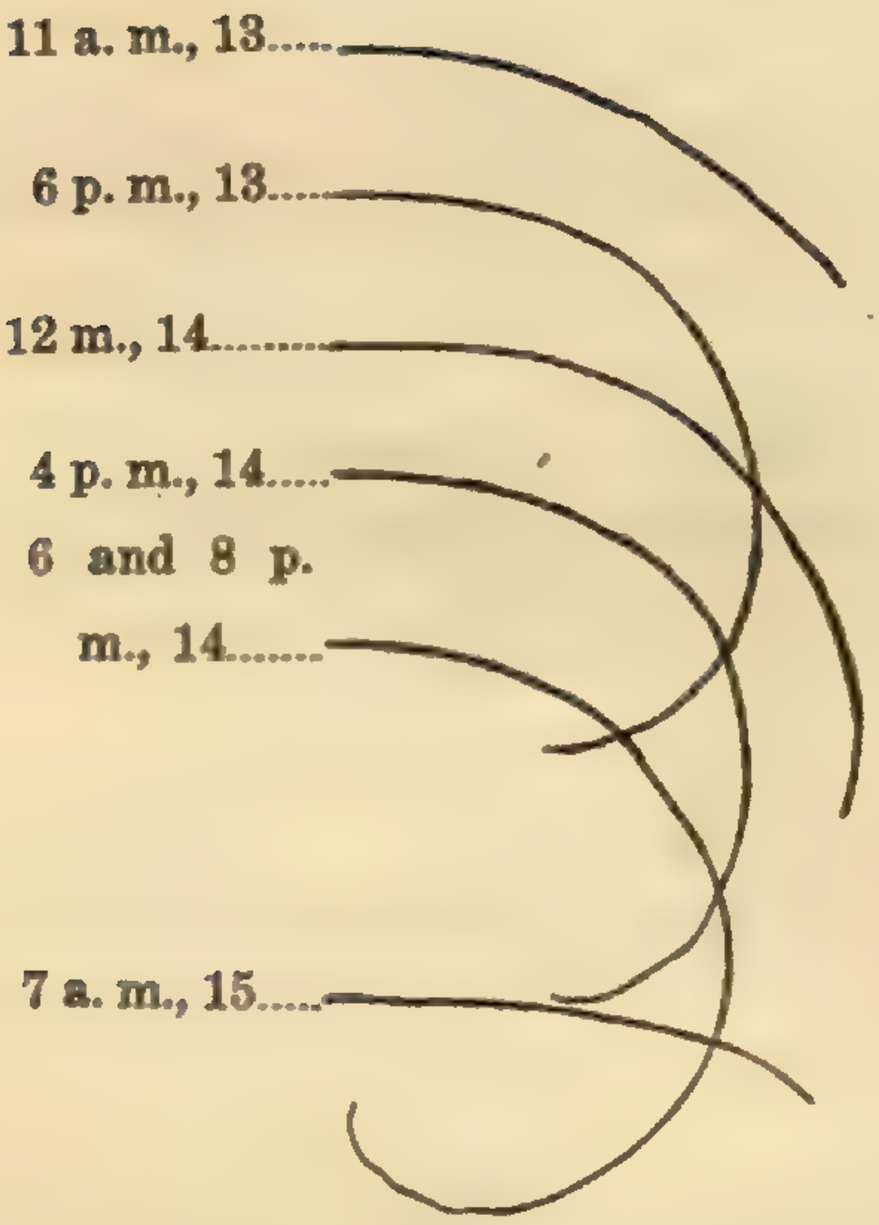
2 G.



Length, 11 a. m., April 13, 7.5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

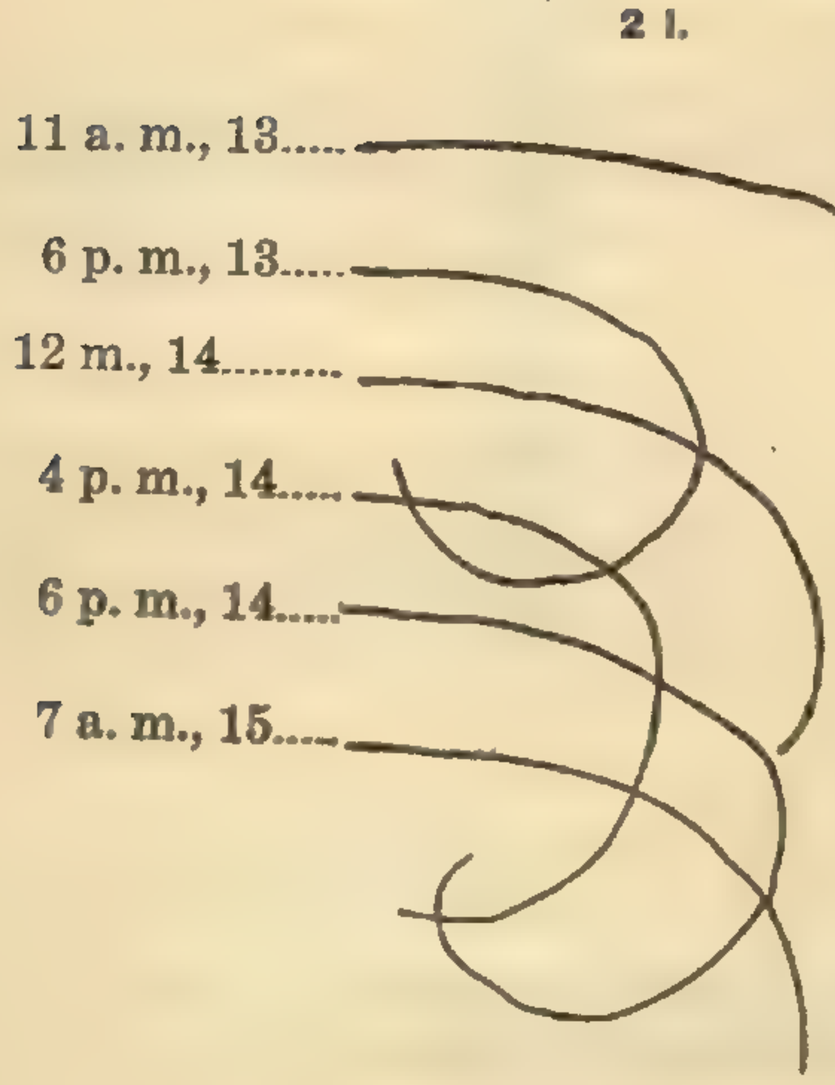
Zone.	Growth.
1	3.5
2	4.0
3	4.5
4	4.0
5	3.4
6	3.0
7	2.0
8, 9, 10	10.0
11	3.5
12	3.0
13	2.0
14	1.7
Total	44.6, or 63.71 per cent.

2 H.



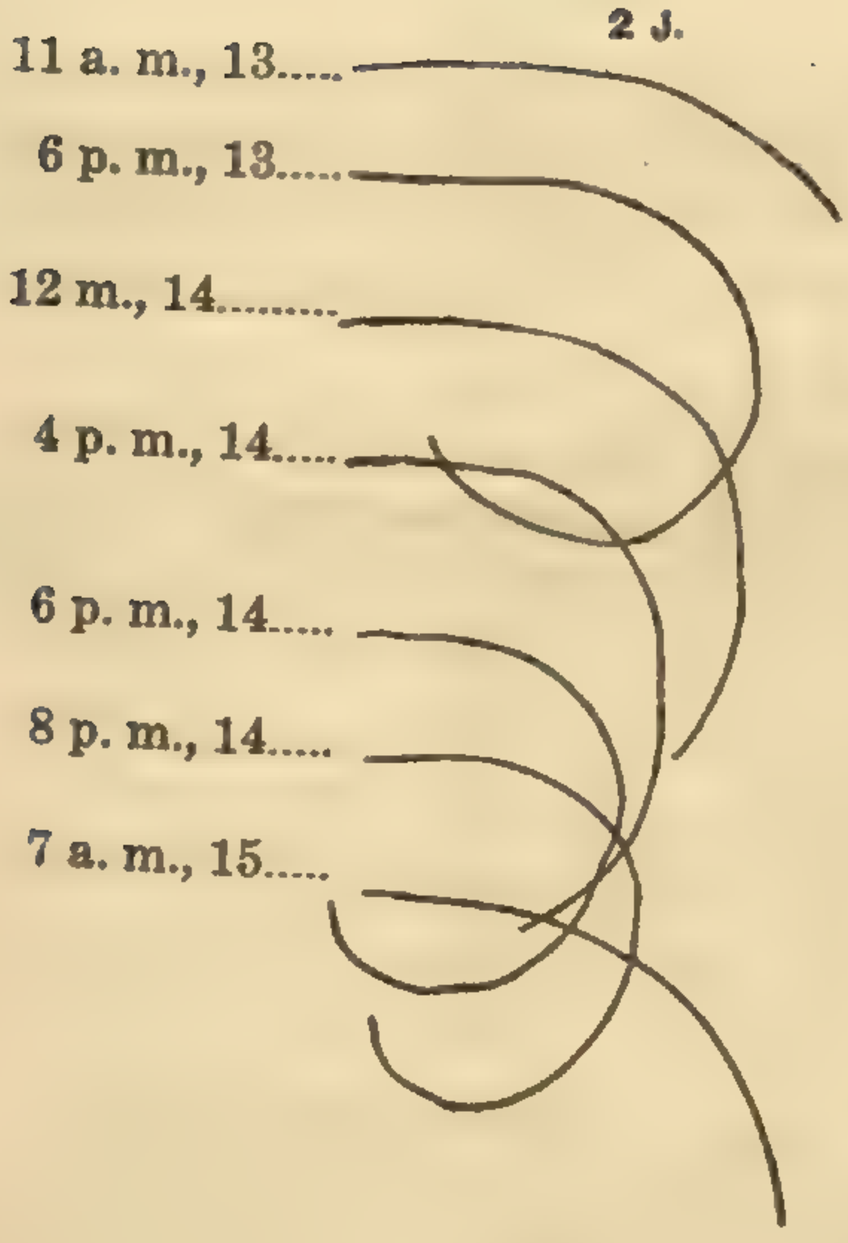
Length, 11 a. m., April 13, 10 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.	Growth.
1	3.0
2	4.0
3	4.6
4	3.0
5	2.8
6	3.0
7	2.2
8	1.8
9	2.0
10	2.5
11	2.5
12	2.2
13	2.2
14	2.3
15	2.5
16	2.0
17	1.5
18	1.0
19	.5
Total	45.6, or 48 per cent.



Length, 11 a. m., April 13, 9 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

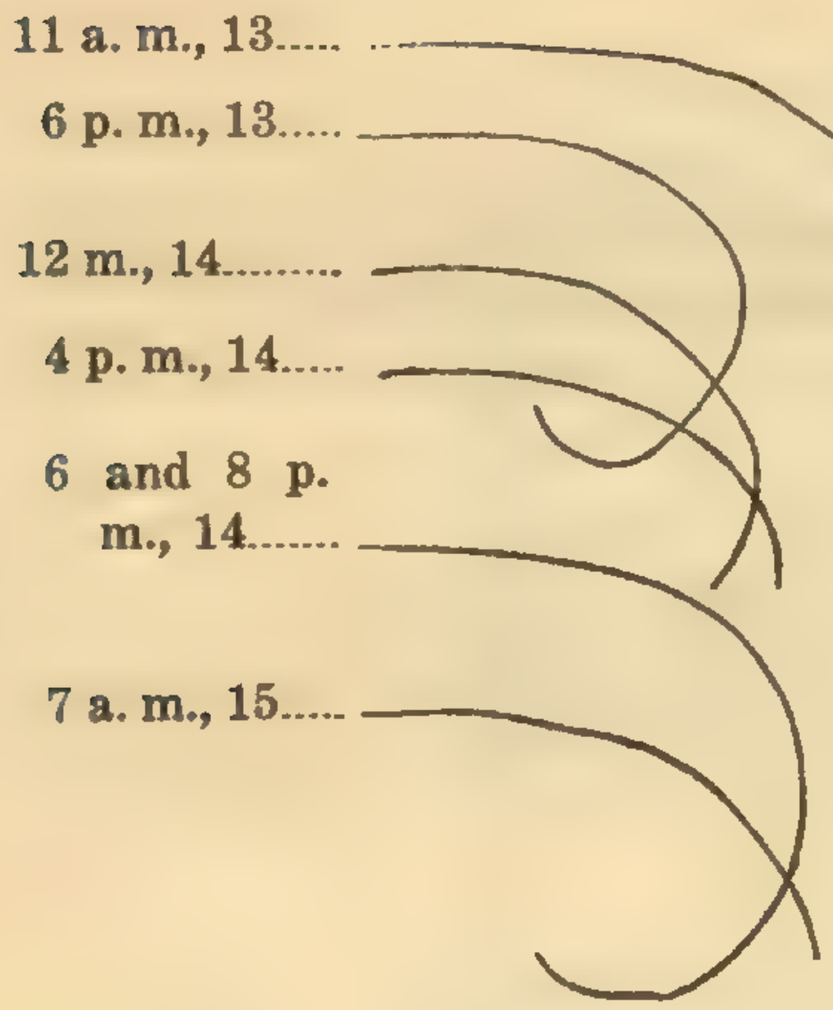
Zone.		Growth.
1	.....	3.0
2	.....	5.5
3	.....	3.7
4	.....	3.5
5	.....	3.8
6	.....	3.2
7	.....	2.5
8	.....	2.5
9	.....	2.7
10	.....	3.6
11	.....	3.4
12	.....	3.5
13	.....	3.7
14	.....	3.0
15	.....	2.5
16	.....	2.0
17	.....	.0
Total		52.1, or 65.125 per cent.



Length, 11 a. m., April 13, 12 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.		Growth.
1	.....	5.0
2	.....	4.0
3	.....	3.5
4	.....	3.5
5	.....	3.7
6	.....	3.0
7	.....	2.6
8	.....	2.5
9	.....	3.0
10	.....	3.2
11	.....	2.5
12	.....	3.0
13	.....	3.0
14	.....	1.7
15	.....	2.0
16	.....	1.5
17	.....	.0
Total.....		47.7, or 57.125 per cent of the growing region.

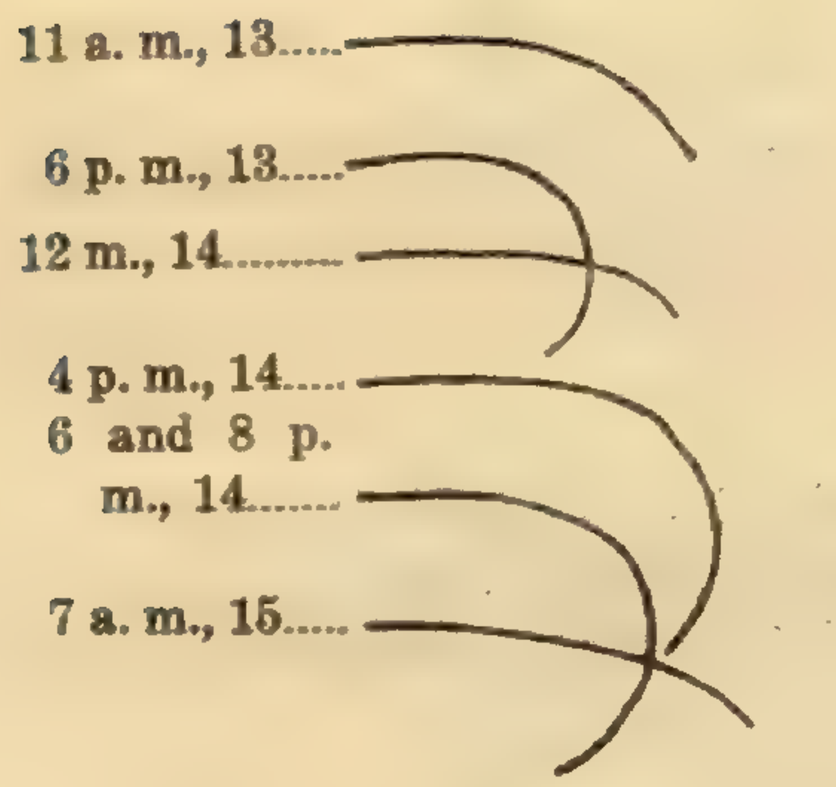
2 K.



Length, 11 a. m., April 13, 8 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.		Growth.
1	.....	3.0
2	.....	4.2
3	.....	3.5
4	.....	4.0
5	.....	3.6
6	.....	3.5
7	.....	3.5
8	.....	3.5
9	.....	3.6
10	.....	3.5
11	.....	4.0
12	.....	4.0
13	.....	1.7
14	.....	1.9
15	.....	1.0
16	.....	.6
Total		49.1, or 61.375 per cent.

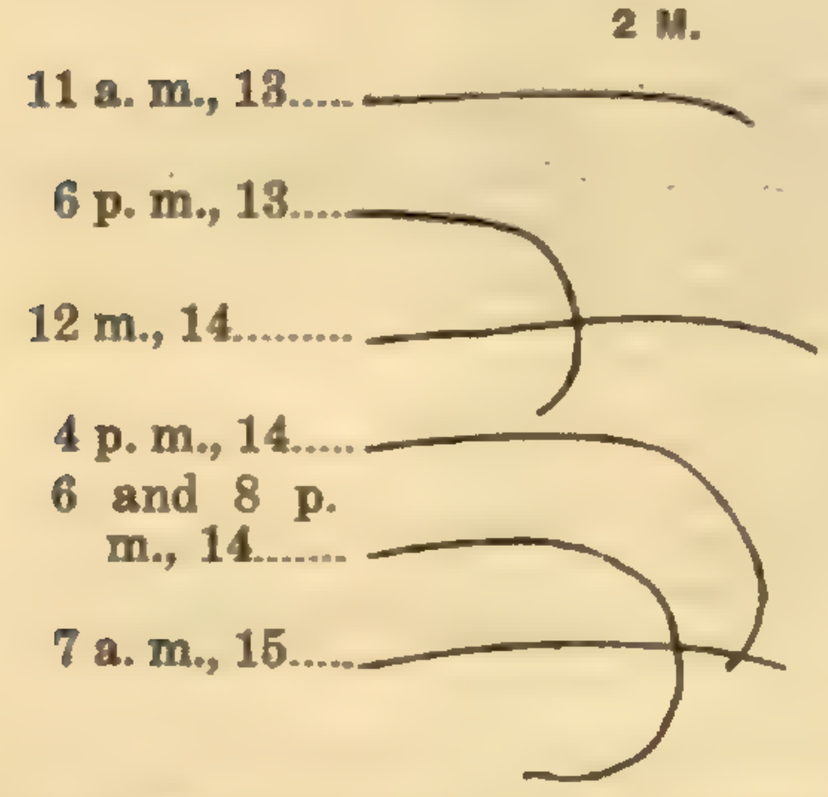
2 L.



Length, 11 a. m., April 13, 5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.		Growth.
1	.....	2.0
2	.....	2.5
3	.....	2.5
4	.....	2.5
5	.....	2.0
6	.....	2.0
7	.....	2.6
8	.....	3.0
9	.....	1.0
10	.....	1.0
Total		21.1, or 42.2 per cent.

2 M.



Length, 11 a. m., April 13, 4.5 cm.
Marked in 5 mm zones.
Increment, 12 noon, April 14:

Zone.		Growth.
1	.....	1.5
2	.....	3.4
3	.....	3.0
4	.....	3.0
5	.....	3.0
6	.....	3.0
7	.....	3.7
8	.....	2.4
9	.....	.0
Total		23.0, or 57.5 per cent.

To produce and eliminate during each day curvatures as great as these must require decidedly rapid growth in length. The tables which accompany the figures show how rapid this growth is. On twigs which have not passed through their time of most rapid elongation, there are usually some zones whose increment of length during twenty-four hours is as much as 100 per cent. All of the zones of the younger twigs elongate and the twig as a whole is likely to elongate by as much as 60 per cent. Older twigs of course grow more slowly than these, and their curvatures are correspondingly less conspicuous. The growing region is always a long one, and in most cases a number of zones grow about equally fast. However, a few twigs showed zones of especially rapid elongation. The greatest increment observed in any zone in twenty-four hours was 220 per cent.

With regard to the hours during which the curvatures took place, it was observed that there was not absolute regularity but that the different twigs varied by an hour or so in the beginning of the downward movement and in its progress. In general the twigs are straight, or as nearly so as the individual ones become, by at least as early as 5 o'clock in the morning. No observations were made earlier than this. They retain this position for a number of hours longer. By 11 o'clock some, but not all, of the twigs begin to curve downward. The curvature is slow until about the middle of the afternoon, being most rapid between 3 o'clock and 5 o'clock. By 6 o'clock many twigs have assumed the night position, while others show some additional curvature at 8 o'clock in the evening.

It is convenient to speak of a day position meaning that which the twigs are found in during at least the forenoon, and of a night position meaning that observed in the late evening, and which is unchanged at least to 10 o'clock, which was the latest hour at which observation was made. It should be observed, however, that the day position is assumed during the night, and that the night position is assumed during the day.

The position finally assumed by each twig when it ceases to grow in length does not differ perceptibly from that which it has occupied during the forenoons while it was growing. At first sight this seems quite remarkable and it would rather have been anticipated that the ultimate position would have been a compromise between those previously assumed during the day and during the night. The explanation is found in the fact that the growing region is longer during the night than during the day. Measurements were made of the growth from 6 o'clock

to 6 o'clock, and it was found that during the night all zones grow which have grown during the preceding twelve hours of day; but that during each day the extreme back part of the region which has elongated during the preceding night ceases to increase in length. Obviously no zones curve when they do not grow, and since the last growth of each zone takes place during the night, when it is brought into the day position, it follows that this position is the final one assumed, and that therefore all parts of each twig come permanently into the day position. It may be remarked that the growth is in general somewhat more rapid at night than it is during the day. However, this would not in itself result in final assumption of the day position, if it were not that the growing region is shorter during the day.

An attempt was made to determine the causes of the curvature. From the regular succession of day and night positions, it is obvious that those conditions subject to diurnal change are in one sense the responsible factors. These are primarily the light, and in a measure, perhaps, the temperature. Neither of these can possibly be a directive stimulus. Light, or light and temperature combined, act merely as conditions which determine the response to other conditions which are directive. A priori the curvatures might be assumed under the influence of gravity, or of internal directive factors, tendencies known as hyponasty, epinasty and rectipetality, or these internal factors and gravity might be jointly responsible. As it was impracticable in dealing with this kind of a subject to eliminate the action of gravity, recourse was had to the scheme of reversing the position of a branch.

Two of the branches already experimented with were long enough so that it was practicable to bend them near the bottom and bring the actively growing twigs through an angle of 180° so that what had been the upper side of each twig became the lower. This was done at 7.30 in the morning, while the twigs were in what is called the day position. Since the twigs are not exactly the same shape, and do not stand at the same angle toward the horizontal, they were unequally exposed to the action of gravity after the position of the branch was reversed. Some of them were so placed that epinasty and geotropism, as tendencies possibly responsible for the day movement, were brought into almost exact conflict. Other twigs fall into such a position that the two possible conflicting forces acted obliquely to one another. The result during the day was the development of a diverse and decidedly complicated lot of curves. By evening,

all of the more active growing twigs had assumed a more or less spiral form, although none of them had made more than a single turn. Within the following two days all actively growing twigs had drawn out, making a single twist by which the distal part of the twig had returned to its original position with regard to the vertical.

The curves assumed during the first day showed that in the case of actively growing twigs, gravity and internal tendencies are jointly responsible for the curvatures and that the shares of the two are on the whole not very unequal. The first curvatures executed were performed under the influence of the internal directive factors. In two of the active twigs whose position was most exactly reversed, epinasty caused the distal part of the twig to pass the vertical so that on this part positive geotropism and epinasty then acted together, in the same direction. Except in this case the action of gravity seemed after a few hours to be more powerful with regard to the younger parts of the twig than did the epinasty. On the older parts epinasty retained the ascendency through the day with the result that twigs which had almost ceased to grow executed almost the usual daily curvature in the usual direction with regard to the parent stem, and without any evident regard to the directive action of gravity.

The observations which have just been reported, on the behavior of stems whose natural position with regard to gravity had been reversed, furnish a satisfactory explanation of at least the one class of torsions, which resulted when the twig again became straight, with all but the oldest parts twisted into its original position. In this case, it is perfectly obvious that the torsion results from the conflict of two opposing directive agents, of which, in this case, one is external and one internal.

Finally, it is of interest to note that the diurnal movements of *Lagerstroemia* have a very obvious biological significance. The young parts of twigs growing with such rapidity are inevitably delicate and very easily broken. In the day position, they are obviously much more exposed to danger from almost every environmental factor which might injure them than they are in the night position. Mechanical injury due to the wind, and the attacks of animals larger than insects, are the most evident dangers from which the assumption of the night position affords a measure of protection. The movements continue after the leaves on the curving part of the stem develop an appreciable area, and probably need to be exposed to ordinary illumination

for the sake of their own proper development even before they begin to perform any considerable photosynthetic work. During the day, they occupy a position where they get whatever advantages the light may bring; while the oldest parts permanently assume this position. At night, when the exposure to the light and its advantages is impossible, they assume a position in which they are protected from the dangers incidental to the day position.

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ADDITIONS TO THE BASIDIOMYCETOUS FLORA OF THE PHILIPPINES

By PAUL W. GRAFF

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

HYMENOMYCETEAE

TREMELLINEAE

EXIDIA Fries

EXIDIA LAGUNENSIS Graff sp. nov.

Pileis erumpentibus, gelatinoso-carnosis, plicato-irregularibus, ramosis, albis vel albo-flavis, 1.5 cm crassis, 2 ad 2.5 cm altis, stipite brevissimo, badio, 5 mm crasso praeditis; basidiis globosis, 4-sporis, 9 x 9 ad 10.5 μ; sterigmatibus praelongis, 7.5 ad 10.5 μ longis; sporis oblongis, parvis, curvulis, 1.5 x 3 ad 3.5 μ.

Pileus gelatinous-fleshy, branching, white to yellowish, 1.5 cm broad, 2 to 2.5 cm high, with a hort stipe of a yellow-brown color, 5 cm in diameter. Basidia globose, 9 by 9 to 10.5 μ, divided into four cells by longitudinal partitions, 4-spored. Sterigmata elongate, 7.5 to 10.5 μ, usually as long as the basidia. Spores small, oblong, curved, continuous, 1.5 by 3 to 3.5 μ, hyaline.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 20972 Graff*, February 20, 1912, on decaying wood.

PILACRE Fries

PILACRE ORIENTALE Berk. & Br. in Journ. Linn. Soc. Bot. 14 (1875) 101.

LUZON, Province of Laguna, Los Baños, *Baker 9*, August 29, 1912, on dead wood.

POLYPOREAE

POLYPORUS Micheli

POLYPORUS ANEBUS Berk. in Hook. Lond. Journ. Bot. 6 (1847) 504.

LUZON, Province of Laguna, Los Baños, *Baker 297*, October 31, 1912.

FOMES Fries

FOMES SEMITOSTUS Berk. in Hook. Journ. Bot. & Kew Gard. Misc. 6 (1854) 143.

BASILAN, Isabela, *Bur. Sci. 20975 Basilan Plantation Co.*, September, 1912, on *Hevea brasiliensis*.

POLYSTICTUS Fries

POLYSTICTUS BOGORIENSIS (Holt.) Sacc. & Syd. in Sacc. Syll. Fung. 16 (1902) 157.

Polyporus bogoriensis Holt. in Mykol. Unters. Trop. (1898) 94.

LUZON, Subprovince of Ifugao, Mount Polis, *Bur. Sci. 20377 McGregor*, February, 1913.

This species is also represented in our herbarium by a specimen from Nha-trang, Annam, Indo-China, *C. B. Robinson 1417*, March, 1911.

TRAMETES Fries

TRAMETES GRISEA Pat. in Journ. de Bot. 11 (1897) 341.

LUZON, Province of Laguna, Mount Maquiling, *Baker 464*, November 5, 1912.

FAVOLUS Fries

FAVOLUS ALBIDUS Massee in Bot. Tidsskrift 24 (1902) 217.

LUZON, Province of Laguna, Los Baños, *Baker 56*, September 17, 1912, on dead fallen branches.

LASCHIA Fries

LASCHIA (FAVOLASCHIA) GOETZEI P. Henn. in Engl. Bot. Jahrb. 28 (1900) 322.

LUZON, Province of Laguna, Los Baños, *Baker 67*, September 22, 1912.

LASCHIA LUZONENSIS (Murrill) Graff comb. nov.

Hexagona luzonensis Murrill in Bull. Torr. Bot. Club 35 (1908) 401.
Favolus luzonensis Sacc. & Trott. in Sacc. Syll. Fung. 21 (1912) 356.

LUZON, Province of Bataan, Lamao, *For. Bur. 7541 Curran*, September, 1907, on dead wood.

This fungus, when dry, resembles very closely those members of the genus *Favolus* for which Murrill's genus *Hexagona* is a synonym; hence the reason for the transfer by Saccardo and Trotter without their having seen the fungus in question. As this species is gelatinous rather than fleshy, with alveoli homogeneous with the pileus instead of being lamellate-pored, its location in the genus *Laschia* seems the most reasonable.

LASCHIA PHILIPPINENSIS Graff sp. nov.

Pileis gelatinosis, reniformibus, planis, glabris, albis, 1 ad 1.5 cm longis, 1.5 ad cm latis, 1 ad 2 mm crassis, subsessilibus vel stipitatis; stipite latere vel faciei dorsali affixo, subcartilagineo, cylindrico, 2 mm diametro; alveolis magnis, subhexagonis, inaequalibus, mediis latioribus 1.5 x 2 mm; dissepimentis crassis,

gelatinosis; basidiis clavatis, 3.7 x 21 μ, 4-sterigmaticis; sterigmatibus curvulatis, 3 μ longis; sporis globosis, 4.5 μ, hyalinis, guttulatis.

Pileus soft and gelatinous, shrinking considerably when dried, reniform, white, 1 to 1.5 cm long, 1.5 to 2 cm broad, and 1 to 2 mm thick, subsessile or short-stipitate, the stipe, when present. lateral or on the dorsal surface. Stipe subcartilaginous, short-cylindric, 2 mm in diameter. Alveoli large, subhexagonal, 1.5 by 2 mm. Dissepiments thick and gelatinous. Basidia club-shaped, 3.7 by 21 μ, with 4 sterigmata. Sterigmata curved, 3 μ long. Spores globose, hyaline, 4.5 μ in diameter, guttulate.

LUZON, Province of Laguna, Mount Maquiling, *Bur. Sci. 20980 Clemens*, May, 1912, on decaying wood.

AGARICINEAE

LEPIOTA Fries

LEPIOTA CHLOROSPORA Copel. in Ann. Myc. 3 (1905) 28; Govt. Lab. Publ. 28 (1905) 143.

LUZON, Manila, *Bur. Sci. 20979 Graff*, August, 1912, growing on lawn.

This specimen has been identified by Doctor Copeland as identical with his type which has been lost. The fungus was originally described as an edible species but cases have come to note where it has acted as a violent emetic. It seems, therefore, that discretion must be exercised in its use as a food.

LENTINUS Fries

LENTINUS CANDIDUS Graff sp. nov. Plate VIII.

Pileis solitariis vel gregariis, carnoso-coriaceis, mollibus, tenuibus, candidis, infundibuliformibus, mox patentibus reflexisque, glabris, alutaceis, 10 ad 15 cm latis, 10 ad 18 cm altis; margine acuto, sublobato, involuto; stipite centrale, albo, cylindrico, rigido, duro, solido, squamoso, 8 ad 12 cm longo, 1 ad 1.5 cm crasso; lamellis confertis, angustis, membranaceis, postea furcatis vel interdum anastomosantibus, albis; basidiis clavatis, 5 x 19.5 μ; sterigmatibus 1.5 μ longis; sporis elliptico-rotundatis, 3 x 4.5 μ, hyalinis.

Plants solitary to gregarious and clustered, pileus thin, coriaceous-fleshy in texture, pliable, white, smooth, the upper surface resembling white fine-grained kid, funnel-shaped, at first expanded but in old specimens becoming reflexed, measuring from 10 to 15 cm across and 10 to 18 cm high when mature, the margin acute, involute and sublobate. Stipe central, white, solid, rigid and quite hard, of nearly the same diameter throughout, 8 to 12

cm long, 1 to 1.5 cm in diameter, covered with fine flocculent scales, somewhat striate. Lamellae compact, narrow, membranaceous, decurrent, dividing dichotomously, and later occasionally anastomosing, white. Basidia club-shaped, 5 by 19.5 μ. Sterigmata 1.5 μ long, curved. Spores round-elliptic, 3 by 4.5 μ, hyaline.

LUZON, Province of Rizal, *Bur. Sci. 16840 Reillo*, July, 1912. Growing on wood in forest.

LENTINUS LAGUNENSIS Graff sp. nov. Plate IX.

Gregarius, pileis carnoso-coriaceis, mollibus, tenuibus, fuscis, infundibuliformibus, glabris, 10 ad 20 cm latis, 12 ad 25 cm altis, margine lobato, mox patente reflexoque; stipite 8 ad 15 cm longo, 1 ad 2 cm crasso, rigido, duro, fibroso-corticato, solido, substriato, fusco-villoso; lamellis profunde decurrentibus, confertis, angustis, membranaceis, albis, dein flavis; basidiis clavatis, 2.2 x 12 μ; sterigmatibus 3 μ longis; sporis hyalinis 2 x 3.5 μ, sphaeroideo-ellipsoideis.

Plants gregarious. Pileus thin, fleshy in texture, pliable, brown, funnel-form, 10 to 20 cm broad, 12 to 25 cm high. Margin irregularly lobate, becoming reflexed and somewhat lacerate when old. Stipe 8 to 15 cm long, 1 to 2 cm thick, the thickness nearly equal throughout except for a slight increase at the top as it merges into the cap, interior white, spongy, solid, cortex fibrous, brown-pubescent. Lamellae decurrent, narrow, compressed, white, becoming yellowish-brown. Basidia club-shaped, 2.8 by 12 μ. Sterigmata 3 μ long. Spores colorless, 2 by 3.5 μ, round-elliptic.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 16839 Ramos*, June, 1912, in forest.

LENTINUS SUBNUDUS Berk. in Hook. Lond. Journ. Bot. 6 (1847) 492.

LUZON, Province of Nueva Vizcaya, Dupax, *Bur. Sci. 14373a, 14374a, McGregor*, March–April, 1912.

VOLVARIA Fries

VOLVARIA PRUINOSA Graff sp. nov. Plate X.

Pileis carnosis, primo hemisphaericis, obtusis, dein late expanso-planis, centro non umbonato, perfecte orbicularibus, 3 ad 6 cm diam., pruinoso-albis, laevibus, viscidis, margine tenui, albo vel dilutissime roseo; lamellis liberis, carneis, fragilibus, rotundato-ventricosis, pallidis, dein roseis; stipite recto, tereto, 4 ad 5.5 cm longo, basi vix incrassatulo, 7 ad 9 mm, medio subattenuato, 5 ad 6 mm, albo, e volva parva libera oriundo; volva alba,

9 ad 12 mm diam.; sporis ellipticis, saepius inaequalibus, sursum obtusis, deorsum rotundato-acutatis, 7.5 ad 8 x 13 ad 15 μ, roseo-fulvis.

Pileus fleshy, at first globose to hemispheric, expanding to form a flat round cap, 3 to 6 cm in diameter, frosty-white, soft, smooth, viscous, with a thin white margin through which the rosy color of the spores beneath often shows. Gills free from the stipe, fragile, fleshy, well rounded, pale, becoming rosy. Stipe erect, 4 to 5.5 cm long with a slightly enlarged base, the diameter at the base 7 to 9 mm and near the middle 5 to 6 mm, white, with a small volva. Volva white, globose, from 9 to 12 mm in diameter. Spores irregularly elliptic, apex obtuse, base acute, 7.5 to 8 by 13 to 15 μ, rose-brown.

LUZON, Manila, Pasay, *Merrill 8723*, July 29, 1912. Found growing on the sandy beach in the shade of *Pandanus tectorius*, near salt water.

NAUCORIA Fries

NAUCORIA MANILENSIS Graff sp. nov.

Solitaria vel gregaria; pileis carnosis, hemisphaericis vel convexo-planis, laevibus, glabris, hygrophanis, flavo-brunneis, pallide marginatis, 2 ad 3 cm diam., carne alba, margine introrse revoluto dein recto, integro; lamellis tridymis, membranaceis, brunneis, adnatis, 3 mm latis; stipite fulvo-flavescente, cylindraceo, farcto, fibrilloso-striato, 3.5 ad 5 cm longo, 2 ad 3 mm crasso, basi vix incrassato; basidiis clavatis, hyalinis; sporis ellipticis, inaequilateralibus, 6.5 ad 7.5 x 11 ad 12.5 μ, fuscis.

Plants solitary to gregarious, seldom more than three or four in a cluster, attached at the base of the stipe, at first hemispheric but soon expanding, 2 to 3 cm in diameter, fleshy, smooth, slightly viscid when fresh, yellowish-brown, margin light with darker center, flesh white, margin incurved, becoming expanded in old specimens. Lamellae of three lengths, thick-membranaceous, brown, adnate, 3 mm broad. Stipe of same color as margin of the cap, cylindric, stuffed, fibrous, striate, 3.5 to 5 cm long, 2 to 3 mm thick, with a somewhat enlarged base. Basidia clavate, hyaline. Spores elliptic, somewhat curved, 6.5 to 7.5 by 11 to 12 μ, brown.

LUZON, Manila, *Bur. Sci. 20974 Graff*, May 28, 1913, in grass by roadside.

PANAEOLUS Fries

PANAEOLUS VELUTICEPS Cooke & Mass. in Grevillea 18 (1889) 4.

LUZON, vicinity of Manila, *Bur. Sci. 11004 Brown*, December 29, 1911.

GASTEROMYCETEAE

PHALLOIDEAE

DICTYOPHORA Desvaux

DICTYOPHORA MERULINA Berk. cfr. Intellectual Obs. 9 (1866) 401, Journ. Linn. Soc. Bot. 13 (1873) 172.

Dictyophora (*Clautriavia*) *irpicina* Pat. in Bull. Soc. Myc. France 17 (1898) 190.

LUZON, Manila, *Bur. Sci. 20978 Graff*, June 6, 1913, growing in grass by roadside.

DICTYOPHORA PHALLOIDEA Desv. Journ. Bot. 2 (1809) 88.

Phallus indusiatus Ventenat in Mém. Inst. Nat. Sci. Arts Sci. Math. Phys. 1 (1789) 520.

Hymenophallus indusiatus Nees in Syst. Pilze Schwamme (1817).

? Dictyophora campanulata Nees ex Leveille Mém. Soc. Linn. Paris 5 (1827) 449, pl. 13.

Dictyophora speciosa Kl. ex Meyen in Nov. Act. Acad. Nat. Cur. 19 (1843) Suppl. 1: 239, *pl. 6*. (Plate poor.)

Phallus (*Hymenophallus*) *tunicatus* Schlecht. in Linnaea 31 (1861-1862) 123.

MINDANAO, District of Davao, *Copeland 865*, April 9, 1904, *Weber*, September-October, 1911: Subprovince of Butuan, Butuan, *Weber*, November 23, 1911. LUZON, Province of Nueva Ecija, Cabanatuan, *Bur. Sci. 5268* McGregor, September, 1908: Subprovince of Ifugao, *Bur. Sci. 20976 McGregor*, February, 1913.

ITHYPHALLUS Fries

ITHYPHALLUS IMPUDICUS (L.) Fries Syst. Myc. 2 (1823) 283.

Phallus impudicus Linn. Fl. Suec. (1745) n. 1261.

Phallus vulgaris Micheli Nov. Plant. Gen. (1729).

Phallus foetidus Sowerby in Engl. Fungi (1803) *pl. 329*.

Phallus roseus Delile in Des. Egypte, Hist. Nat. 2 (1813) 300, *pl. 59*.

Hymenophallus hadriani Nees Syst. Pilze Schwämme (1817).

Phallus iosmos Berk. in Smith Engl. Flor. 5^2 (1836) 227.

Phallus imperialis Schulzer ex Kelchbr. Ic. Select. Hymen. Hungariae (1877) 63, *pl. 40*.

LUZON, vicinity of Manila, *Sanchez 22*, August, 1912.

MUTINUS Fries

MUTINUS BAMBUSINUS (Zoll.) E. Fischer in Ann. Jard. Bot. Buitenz. 6 (1886) 30, *pl. 4, 5*.

Phallus (*Cynophallus*) *bambusinus* Zoll. Syst. Verzeich. Ind. Arch. 1 (1854) 11.

LEYTE, Malitbog, *Weber*, January, 1912. LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20977 McGregor*, January, 1913, at the base of bamboo stalks.

SIMBLUM Klotzsch

SIMBLUM PERIPHRAGMOIDES Klotzsch in Hook. Bot. Misc. 2 (1831) 164. *Simblum periphragmaticum* Corda Anleit. Stud. Mycol. (1842) lxxvi, 119.

LUZON, Province of Laguna, Los Baños, *For. Bur. 20385 Curran*, November, 1912.

LYCOPERDACEAE

CYCLODERMA Klotzsch

CYCLODERMA DEPRESSUM Pat. in Bull. Soc. Myc. France (1900) 182, *pl. 7.*

LUZON, Province of Rizal, *Bur. Sci. 1865 Ramos*, January, 1907, on decaying wood of *Artocarpus* sp.

The spores of this species are evidently discharged by a horizontal rupture of the peridium; the portions then separating, expose the contents for dispersal.

TYLOSTOMA Persoon

TYLOSTOMA MUSSOORIENSE P. Henn. in Hedwigia 40 (1901) 337.

LUZON, Province of Bataan, Lamao, *Copeland 1411*, August 9, 1904, terrestrial about decaying stump.

GEASTER (Micheli) Fries

GEASTER TRIPLEX Jungh. in Tidsskr. Nat. Geschied. 7 (1840) 287, pl. *Geaster cryptorhynchus* Haszl. in Grevillea 3 (1874) 163, *pl. 47.*

MINDANAO, Subprovince of Bukidnon, *Bur. Sci. 15795 Fénix*, August, 1912.

BOVISTA Persoon

BOVISTA JONESII Graff sp. nov.

Subglobosa, sessilis, vix radicans, 1 ad 2.5 cm diam., 0.8 ad 2 cm alt.; peridio papyraceo, albo dein flavo-brunneo vel brunneo; floccis minutis albis ostiolo lacero instructo; gleba primo alba, compacta, aquosa, dein flava del flavo-brunnea, pulverulenta, siccata; capillitio subcompacto, flavo-brunneo, plus minus dichotome ramosis, 2.5 ad 3 μ diam.; sporis globosis, laevibus, exappendiculatis, flavo-brunneis, 3.8 ad 4 μ diam.

Pileus subglobose, sessile with a small slender tap-root from which it readily breaks away when ripe, small, from 1 to 2.5 cm in diameter and 0.8 to 2 cm high. Peridium thin and papery, with numerous, minute, flocculent scales, white when young, but with age becoming yellowish-brown and finally dark-brown. Ostiole formed by an irregular rupture at the top. Gleba in young specimens white and watery, changing to yellow and then to yellow-brown, dry and powdery. Capillitium yellow-brown

when mature, subcompact, occasionally branched, 2.5 to 3 μ in diameter. Spores globose, smooth, without appendages, yellow-brown when ripe, 3.8 to 4 μ in diameter.

LUZON, Manila, *Bur. Sci. 20973 C. R. Jones*, May 29, 1913, growing on lawn.

LYCOPERDON Tournefort

LYCOPERDON FURFURACEUM Schaeff. Fung. Bav. Palat. Icon. 3 (1770) *pl. 294.*

Lycoperdon pusillum Batch Elench. Fung. 2 (1789) 228.
Lycoperdon bovista Bolt. Hist. Fung. (1788–1791) 117.
Lycoperdon cepiforme Bull. Champ. (1791–1798) 435, non Chev.
Bovista pusilla Pers. Syn. Fung. (1801) 138.
Lycoperdon pratense Schum. Enum. Plant. Sael. 2 (1803) 193.
Globaria furfuracea Quél. Champ. Jura 3 (1873) 370, *pl. 3.*
Utraria furfuracea Quél. Enchir. (1886) 241.

LUZON, Manila, *Copeland 1351*, April 12, 1904, on lawn.

LYCOPERDON LILACINUM (Mont. & Berk.) Speg. in Anal. Mus. Nac. Buenos Aires (1899) 110.

Bovista lilacina Mont. & Berk. in Hook. Lond. Journ. Bot. 4 (1845) 64.

LUZON, Manila, *Copeland 1352*, June 10, 1904.

LYCOPERDON PIRIFORME Schaeff. Icon. (1761) 189.

Lycoperdon ramosum Jacq. Fl. Austr. (1773–1778) 224.
Lycoperdon ovoideum Bull. Champ. (1791–1798) 435.

LUZON, Subprovince of Benguet, Mount Santo Tomás, *Merrill 7921*, May 21, 1911, on earth at an altitude of 1900 m.

LYCOPERDON TODAYENSE Copel. in Ann. Myc. 3 (1905) 25; Gov. Lab. Publ. 28 (1905) 141.

LUZON, Manila, *Merrill s, n.*, January, 1904, on earth, *Bur. Sci. 11003 Brown & Graff*, December 5, 1911, growing on lawn.

The latter was referred to Doctor Copeland for his judgment as to the species, the type having been lost.

SCLERODERMA Persoon

SCLERODERMA AURANTIACUM Pers. Syn. Fung. (1801) 153.

Lycoperdon majus Vail. Bot. Paris (1727) 122, *pl. 16, f. 8.*
Lycoperdon cervinum Bolt. Hist. Fung. (1788–1791) 116.
Lycoperdon aurantiacum Bull. Champ. France (1791–1798) 158.
Scleroderma citrinum Pers. Syn. Fung. (1801) 153.
Lycoperdon tessulatum Schum. Enum. Plant. Sael. 2 (1803) 191.
Scleroderma squamatum Chev. Fl. Gen. Paris (1827) 357.
Scleroderma vulgare Hornem. ex Kroyer in Nat. Tidsskr. 1 (1837) 1969, *f. 2; Fries* Syst. Myc. 3 (1829) 46.

LUZON, Province of Bataan, Mount Mariveles, *Merrill 3689*, January 1, 1904, on damp earth. BABUYANES ISLANDS, Camiguin Island, *Bur. Sci. 4174 Fénix*, June–July, 1907.

AREOLARIA Forquignon

AREOLARIA ? COLUMNARIS (Berk. & Br.) De Toni in Sacc. Fung. 7 (1888) 144.

Scleroderma columnare Berk & Br. in Journ. Linn. Soc. Bot. 14 (1875) 80.

LUZON, Province of Bataan, Lamao, *For. Bur. 7382 Curran*, July, 1907.

POLYSACCUM DeCandolle

POLYSACCUM TUBEROSUM (Mich.) Fr. in Linnaea 5 (1830) 694.

Lycoperdoides tuberosum ferrugineum, arrhizon, pulpa nigra, Mich. Nov. Pl. Gen. (1729) 219, *pl. 98, f. 2.*

LUZON, Province of Bataan, Lamao, *For. Bur. 7537 Curran*, September, 1907, on clay slope among bamboo.

ILLUSTRATIONS

(Photographs by Cortes)

PLATE VIII

Lentinus candidus Graff sp. nov. *Bur. Sci. 15840 Reillo* (Type).
Fresh specimens showing the entire plant.

PLATE IX

FIG. 1. *Lentinus lagunensis* Graff sp. nov. *Bur. Sci. 16839 Ramos* (Type).
Plant, showing the upper surface of the pileus.
2. The same, showing the lower surface. The photographs on this plate are of dried specimens.

PLATE X

Volvaria pruinosa Graff sp. nov. *Merrill 8723* (Type).
Photograph of fresh specimens, ×⅔.

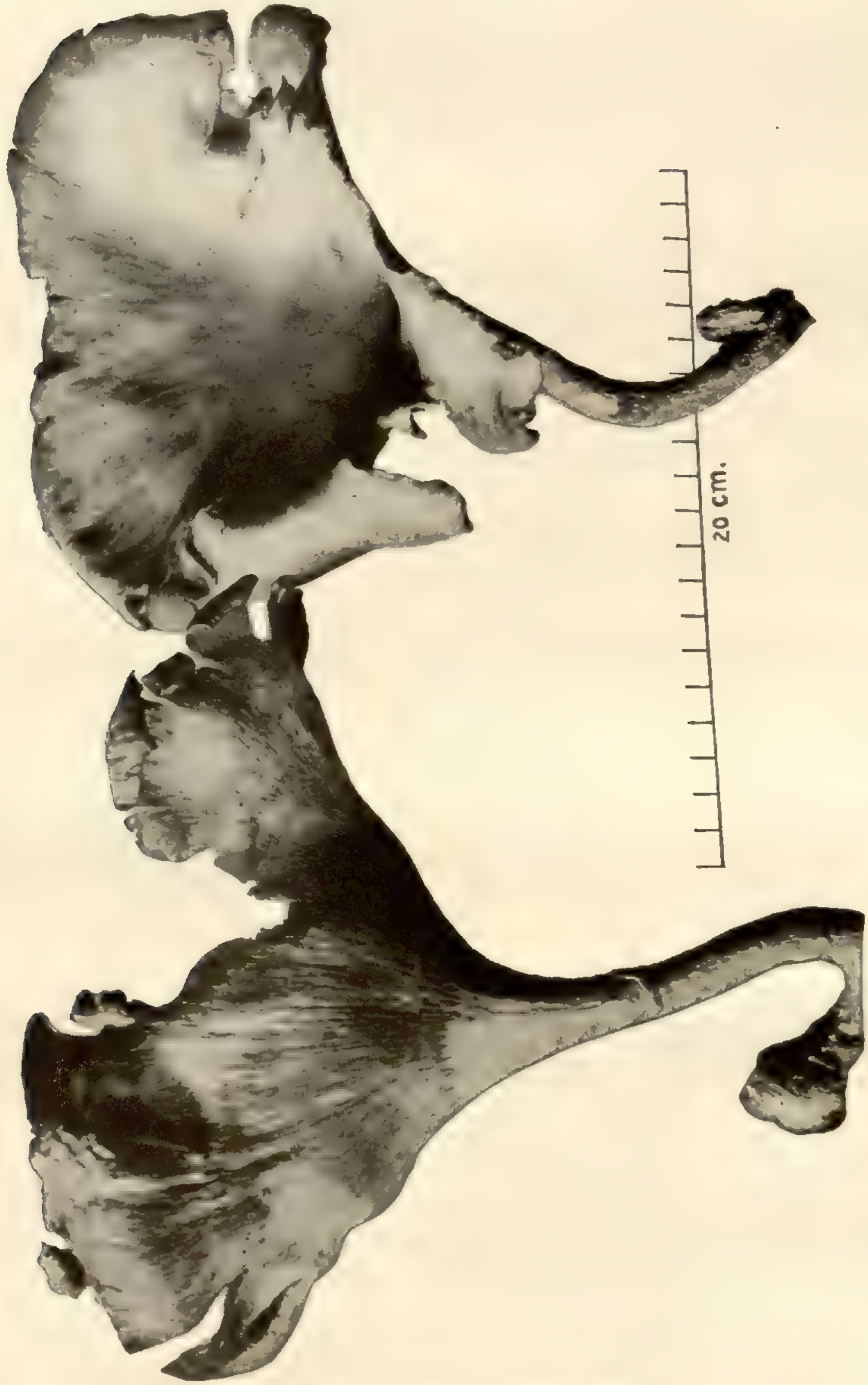

PLATE VIII. LENTINUS CANDIDUS Graff.

Fig. 1. Upper surface of pileus.

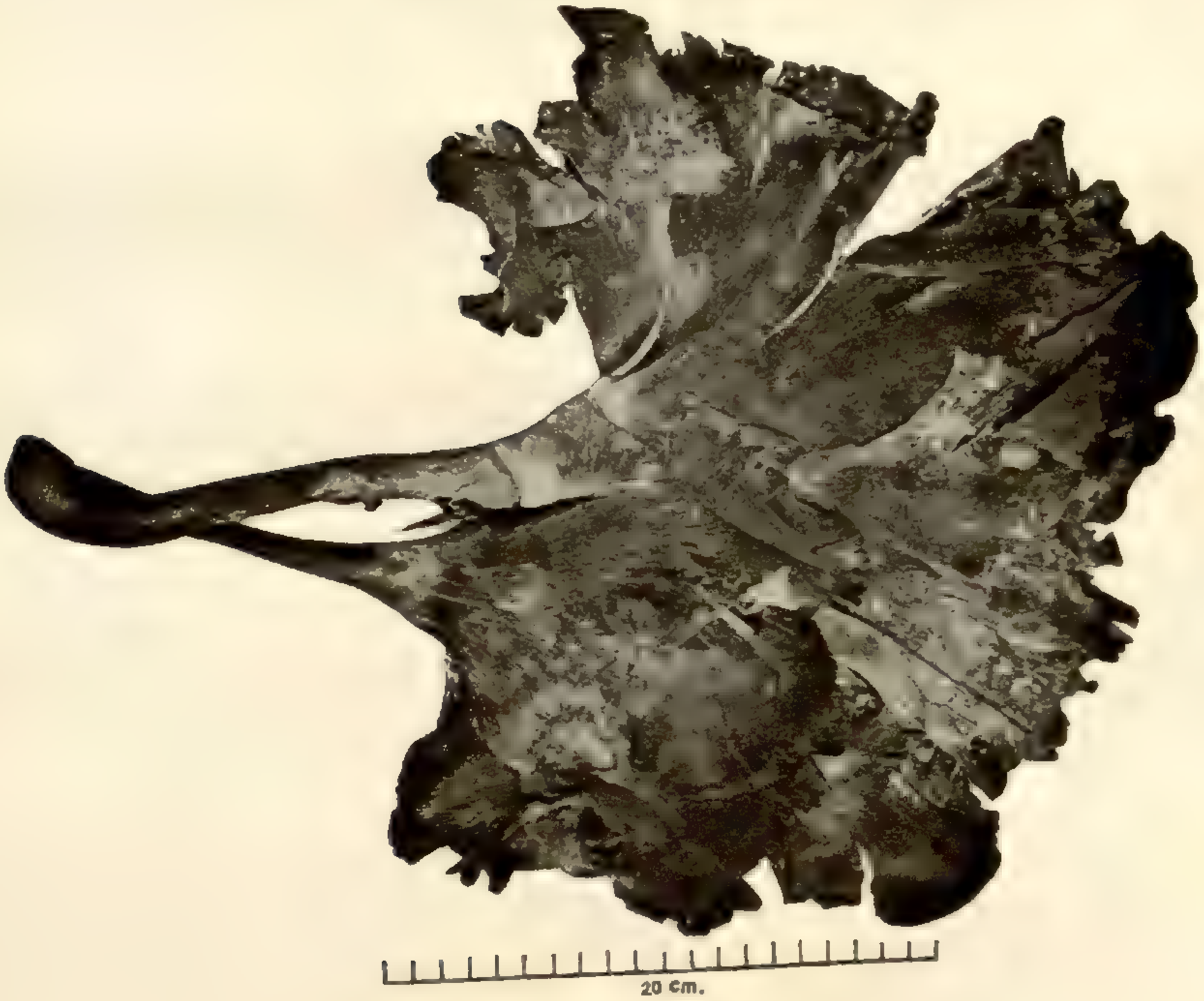

Fig. 2. Lower surface of pileus.

PLATE IX. LENTINUS LAGUNENSIS Graff.

PLATE X. VOLVARIA PRUINOSA Graff.

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CYRTANDRACEAE NOVAE PHILIPPINENSES, II

By F. KRÄNZLIN

(*Berlin, Germany*)

AESCHYNANTHUS Jack

AESCHYNANTHUS EVERETTIANA Kränzl. sp. nov. (§ *Holocalyx*).

Caules tenues, glabri, nitidi, grisei, pauciramosi, radicibus paucis obsiti, internodia 4 ad 5 cm longa. Folia numerosa, brevissime petiolata, petiolis 2 mm longis, setosis, glabra, oblonga vel ovato-oblonga, obtusa, rarius acutata, pergamenea, 3.5 ad 4.5 cm longa, 1.5 ad 1.8 cm lata. Inflorescentiae pauciflorae ex axilla folii cujusdam apicalis orientes, pedunculus brevissimus, dense setosus, pedicelli circ. 1 cm longi, sparsissime albo-pilosi (pilis laxis). Calyx ample urceolaris, margine vix lobatus, 1 cm altus et in orificio latus, glaber. Corolla e basi angusta ampliata, in dorso curvata, lobi labii superioris erecti, subquadrati, retusi, sinu angustissimo sejuncti, labii inferioris lobi laterales late oblongi rotundati, reflexi, lobus intermedius inter formam orbicularem et quadratam intermedius, margine revoluto, deflexus, tota corolla glabra, excepto margine sparsissime setoso, 3.5 cm longa 7-8 mm ampla. Stamina corollam paulum excedentia, subaequilonga. Stylus gracili-fusiformis, dimidium tubi subsuperans, et in illo omnino obcelatus. Stigma et discus parvi. Calyx fusco-purpureus, corolla plane purpurea. Fl. Julio.

NEGROS, *For. Bur. 5585 Everett.*

A species between *Aeschynanthus obconica* C. B. Clarke and *A. hians* C. B. Clarke, but readily distinguished from both. Judging from herbarium specimens it is a rather handsome plant.

AESCHYNANTHUS FIRMA Kränzl. sp. nov. (§ *Haplotrichium*).

Caulis dependens ? satis firmus, lignosus, brachiato-ramosus, internodia 4.5 ad 5.5 cm longa. Folia brevi-petiolata, basi rotundata, ovata, acuta, crassissima, viva certe succulenta, petiolus 5 mm longus, lamina 8 ad 15 cm longa, 5 cm lata. Flores in axillis foliorum versus apicem caulis (de inflorescentia nil certi proferre audeo), pedicelli 6-7 mm longi, glabri. Calyx 8 ad 9 mm longus, fere basin usque fissus, lobi anguste trianguli 7 mm. Corolla leviter incurva e basi paulisper ampliose leviter contracta, deinde

denuo paulum ampliata, lobi orificii paulum evoluti, breves margine minutissime fimbriati, illi labii superioris erecti, brevi-spathulati, antice retusi, sinu parvo sejuncti, illi labii inferioris semi-deflexi, angustiores, rotundati, tota corolla 2.5 cm longa, 5 ad 6 mm diam., lobis 3 ad 4 mm longis, excepto margine omnino glabra. Stamina 4, 2 bene longiora quam tubus, 2 tubum vix excedentia, antherae per paria conglutinatae. Stylus corollam aequans, leviter fusiformis, stigma magnum, discus crassus, fere pulvinaris, capsulae ad 18 cm longae. Flores certe purpurei. Fl. Julio, fructus Septembri, Octubri.

MINDANAO, Lake Lanao, Camp Keithley, *Mrs. Clemens s. n.*

There are two specimens, one with flowers, one with fruits, the latter differing from the former only in its larger leaves. The specific name has been selected with regard to the unusual strength of the stem and leaves. The flowers are the characteristic ones of the § *Haplotrichium*. It is impossible to determine from the material available whether the stems are pendulous, or whether they climb along the trunks and branches of trees.

AESCHYNANTHUS GLOMERIFLORA Kränzl. sp. nov. (§ *Haplotrichium*).

Caulis elongatus, tenuis, e nodis radices longas tenues emittans, internodia 8 cm longa, interdum subbreviora aut longiora. Folia brevi-petiolata, late ovata, acuta, 8 ad 12 cm longa, 4 ad 6 cm lata, petiolus 5 ad 10 mm longus, nervus medianus in dorso crassissimus. Flores in glomerulos dispositi, pedunculo subnullo, crasso, floribus delapsis quasi foveato. Pedicelli vix 1 cm longi, minute pilosi. Calyx fere basin usque in lobos 5 anguste triangulos fere lineares, acuminatos divisus, extus minute pilosus. Corolla recta, extus minute pilosa, labii superioris lobi valde approminati breves in unum fere uniti, sinu parvo sejuncti, retusi, labii inferioris lobi laterales semicirculares, lobus intermedius late triangulus, acutus, deflexus, intus pilosus. Stamina tubum paulum excedentia, filamentis superne valde tortis, infra antheras dilatatis. Stylus brevissimus, ovarium breve, discus globosus, totum gynaeceum vix tertiam partem totius corollae aequans. Tota corolla 2.5 cm longa, stamina 2.8 cm, stylus cum disco 8-9 mm, corolla alba et rubra esse dicitur; capsulae 15 ad 18 cm longae. Fl. Augusto, Septembri.

LUZON, Province of Cagayan, *For. Bur. 5257 Klemme:* Province of Tayabas, between Paete and Piapi, *For. Bur. 9561 Curran.* MINDANAO, Lake Lanao, Camp Keithley, *Mrs. Clemens s. n.*

A plant somewhat resembling *Aeschynanthus philippinensis* C. B. Clarke, but with larger leaves. The flowers are rather insignificant, glomerate or fascicled, probably appearing serially. The plant creeps or climbs along the trunks of trees, the roots arising from the fascicles below the flowers. The plant is presumably dimorphous. The ovary in the flower examined was so reduced in size in comparison to the well developed stamens that the supposition that the flower was a staminate one is probably correct.

AESCHYNANTHUS ZAMBOANGENSIS Kränzl. sp. nov. (§ *Haplotrichium*).

Planta certe grandis. Caulis cujus summitas tantum adest, firmus, internodia ad 10 cm longa. Folia petiolo apicem versus curvato erecta, crassa, succulenta, oblonga, acuta, basi rotundata, petiolus ad 1 cm longus, lamina ad 14 cm longa, ultra 5.5 cm lata. Inflorescentiae pauciflorae nodosae, pedunculus nullus, floribus delapsis foveatus, pedicelli circ 1 cm longi, basi incrassati, ipsi et calyces glaberrimi. Calyx basi campanulatus profunde fissus, lobis anguste triangulis, acuminatis, 6 ad 7 mm longus. Corolla leviter curvata e basi ampla paulum dilatata, in orificio brevi-lobata, lobi labii superioris vix sejuncti, retusi, lobi laterales labii inferioris ovati obtusissimi, lobus intermedius retusus, omnes plus minus conniventes, tota corolla extus et intus glabra, pallide sanguineo-purpurea, 2.3 cm longa, 5 ad 6 mm diametro. Stamina et stylus corollam aequantes vel stylus paulisper longior. Capsula linearis 17 cm longa. Fl. Februario.

MINDANAO, District of Zamboanga, *Copeland s. n.*

In many characters this species resembles *Aeschynanthus glomeriflorus* Kränzl., but the leaves are larger, the flowers are entirely glabrous, and, so far as I could determine from the four examined, hermaphrodite. The material is not very copious and for that reason the inflorescence has not been discussed in the description. In the specimen examined the flowers are in the axils of the ultimate leaves, but this may not always be the case.

AESCHYNANTHUS PERGRACILIS Kränzl. sp. nov.

Epiphytica. Caulis gracillimus, tenuis, passim radicans, radicibus filiformibus, cortex viridi-griseus, glaberrimus, internodia 4 ad 5 cm longa. Folia lanceolata, brevi-petiolata, tenui-coriacea, basin versus angustata, acuminata, apice ipso tamen obtusa, cum petiolo 3 ad 5 mm longo 4.5 ad 5 cm longa, medio 1.2 cm lata. Flores semper bini ut videtur semper terminales, pedunculi 1 cm longi, glabri, bracteae late ovato-oblongae, apice obtusissimae, rotundatae, glabrae, 5 mm longae, 3 mm latae, pedicelli aequilongi, tenuissimi. Calyx obconicus, amplus, lobis rotundatis brevibus, haud profunde fissus, glaberrimus, 8 mm longus, lobi circ. 3 mm longi latique. Corolla sigmoidea, superne sensim ampliata, ore obliquo, lobi rotundati, margine pilis glanduligeris ciliata, (corolla ceterum glaberrima), 2.5 ad 2.8 cm longa, ore 1.3 cm lata. Stamina tubum haud excedentia. Flores rubri. Fl. Aprili.

NEGROS, Canlaon Volcano, *Merrill 7047*, in the mossy forest, altitude about 1200 m.

A plant distinguished from other similar ones in the same group by its filiform stems, all parts being very slender. The calyx in form and size is rather near to that of *A. obconica* C. B. Clarke and *A. hians* C. B.

Clarke, but it is quite glabrous, as is also the corolla, except for the lobes which are provided with glandular hairs on the margins.

The leaves are rather small and mostly not longer than the internodes. In the present case, as in many others, it is not altogether pleasant to propose a species on such slight characters, but with our present knowledge of the group we must in such cases admit new species or reduce numerous forms to a few very comprehensive or collective species. In the future, as soon as we know the limits of variability for each species, the latter may be the better plan, but at present it seems best to record the characters of the different forms as accurately as we can, and to describe as new those forms which have sufficiently valid characters to distinguish them from allied species.

AESCHYNANTHUS POLILLENSIS Kränzl. sp. nov.

Epiphytica, bene ramosa. Rami cortice luteo, glabro, passim fragili tecti, internodia 4.5 ad 8 cm longa. Folia brevi-petiolata (5 ad 10 mm), laminae oblongae vel ovato-oblongae, acuminatae, apice ipso obtusae, ad 10 cm longae, 3.5 ad 5 cm latae, glaberrimae. Inflorescentiae axillares (semper?), biflorae, pedunculi mihi non visi, pedicelli 7 mm longi, brevi- et parcissime pilosi ut etiam calyces et corollae extus. Calycis basin usque fissi, segmenta lineari-lanceolata, circ. 7 mm longa. Corolla e basi ampla vix dilatata, vix curvula, lobis parum evolutis, superioribus parvis subconnatis, lateralibus et intermedio (non deflexo) aequalibus, rotundatis, tota corolla 2.5 cm longa, basi 5 mm, in orificio 7 ad 8 mm diametro. Stamina exserta, paulum longiora quam tubus corollae. Stylus bene longior, fere 3 cm longus. Flores obscure rubri, basi albi. Fl. Augusto.

POLILLO, *Bur. Sci. 6862 Robinson*, altitude about 20 m.

A plant similar to *Aeschynanthus philippinensis* C. B. Clarke, but stouter, larger in size, and with larger leaves. The flowers are of the same size in both species, but the color of the present species, "dark-red, base nearly white" is quite different from that of Clarke's species.

DICHROTRICHUM Reinwardt

DICHROTRICHUM MINUS Kränzl. sp. nov.

Caulis longe repens, tenuis, ubique radicosus, setoso-pilosus, pars, quae adest, 30 cm longa; internodia ad 4 cm longa. Folia valde inaequalia, majus petiolatum, minus sessile, petioli 1 ad 1.5 cm longi, setoso-pilosi, laminae ovatae vel oblongae, margine remote grosseque dentatae, basi non in petiolum contractae, apice obtuse acutatae, superne sparsissime setosae, subtus densius, praesertim in venis, maximae 6.5 ad 7 cm longae, 3.5 cm latae, folia minora latissime ovata vel suborbicularia, 1 cm longa lataque. Scapi 18 ad 25 cm longi, setosi, flores subumbellati ad 6 (vel ultra?), bracteae foliis minoribus subaequales, pedicellos pilosos vix 1 cm longos aequantes. Calyx campanulatus, ad

medium circiter divisus, 6 ad 7 mm longus, patens, glaber, lobi apice rotundati. Corolla curvata, sensim ampliata, in lobos 5 transverse oblongos, rotundatos, inter se vix diversos partita, extus sparse pilosa, in margine loborum fimbriata, 2.5 ad utplurimum 2.8 cm longa, in orificio 1.2 cm diametro, intus glabra. Stamina glabra corollam subaequantia, non excedentia, stylus staminibus aequilongus. Capsula submatura ad 20 cm longa, teres, apice vix basin versus longius attenuata. Flores rubri. Fl. Septembri.

NEGROS, Canlaon Volcano, *For. Bur. 17376 Curran*, 1400 to 2000 m altitude.

Very near *Dichrotrichum chorisepalum* C. B. Clarke, but smaller in all its parts. The flowers also present some characters, not very great, it is true, but of sufficient importance to be noted. With more material for comparison this species may, perhaps, ultimately be reduced to Clarke's species as a variety. For the present, however, it seems better to give it specific rank, especially as the material does not impress me as being from a weak or depauperate specimen.

CYRTANDRA Forster

CYRTANDRA WILLIAMSII Kränzl. sp. nov. (§ *Dispares*).

Frutex 1 m altus. Rami tenues, fragiles, pallide grisei, glabri, etiam in apice. Folia alterna altero nempe omnino obsoleto, in tuberculum vix conspicuum reducto, cum opposito evoluto linea elevatula connexo. Folia brevi-petiolata obovato-oblonga vel oblonga, acuta, superne et subtus (etiam in venis et petiolo) glaberrima, superne pallida, secus nervos principales quorum utrinque 6 adsunt, paulum intensius colorati, subtus fere livida, cum petiolo 1 cm longo ad 15 cm longa, 5 cm lata. Inflorescentiae binae oppositae, dichasiales, pauciflorae, pedunculi tenuissimi, 2 cm longi, ipsi, pedicelli calycesque minutissime pilosi, bracteae lanceolatae, pedicellos subaequantes. Calyx basi campanulatus, lobis late triangulis longe acuminatis, 4 mm longus. Corolla calycem subduplo superans, cylindracea, 8 ad 9 mm longa; de limbo et lobis aliquid certi proferre non audeo. Stamina in medio tubo affixa, filamenta fere horizontalia; ovarium ovatum in stylum breviusculum crassum attenuatum, stigma magnum obliquum, discus satis altus, margine integer; haec ommia glabra. Flores albi. Baccae 9–10 mm longae, 6–7 mm crassae, albae, colore ceris. Fl. Februario.

MINDANAO, District of Zamboanga, Sax River, *Williams 2087*, altitude about 200 m.

Another unattractive or at least insignificant species. I had but a single flower at my disposal, the basal parts fairly well preserved, but destroyed at the throat. It is rather difficult to indicate its affinities. There seems to be a small group of the section *Dispares*, all unattractive plants, confined to Mindanao.

CYRTANDRA MISERRIMA Kränzl. sp. nov. (§ *Dispares*).

Frutex. Folia evoluta, alterna, alterum rudimentum minutum reductum, in ramis leviter fractiflexis, griseis, superne tantum sordide pilosis erecta, internodia 1 ad 1.5 cm longa. Folia petiolata, lanceolata, acuminata, basin versus angustata, superne glabra, subtus secus nervos tantum minute fulvo-pilosa, petioli 5 ad 10 mm longi, laminae remote et brevi-dentatae, 10 ad 12 cm longae, 3 cm latae, nervi principales utrinque 6. Inflorescentiae axillares plerumque triflorae, interdum 1-florae, floribus minutissimis mihi adhuc visis, pedunculi brevissimi, pedicelli 2 ad 3 mm longi, ipsi et calyces sordide villosi, bracteae subnullae, ut videtur mox deciduae, mihi non visae. Calyx brevi-campanulatus, lobi semilongi, lineares, totus 3.5 mm longus. Corolla subduplo longior, longe pilosa, integra mihi non visa, decriptionem inaccuratum edere ab horreo.

MINDANAO, District of Davao, Mount Apo, *De Vore & Hoover 317*, in forests.

Although my diagnosis is far from being a satisfactory one, I believe this species is one easily recognizable by its extreme unattractiveness, and its very small flowers. The species of the *parviflora* affinity are beautiful and large-flowered in comparison to the species above described.

CYRTANDRA PACHYPHYLLA Kränzl. sp. nov. (§ *Dispares*).

Frutex. Summitates tantum adsunt. Caulis tetragonus strictus, crassiusculus, glaber, siccitate niger, internodia, quorum suprema tantum vidi, ad 4 cm longa, vel imo in apice ipso caulis nondum evoluto, breviora. Folia alternantia, folio altero cujusque paris omnino obsoleto, longe petiolata, late oblonga, altero latere in petiolum paulum decurrentia, crassa, sicca firma, acuta, toto margine excepta ipsa basi dentata, sicca superne nigra, glabra, subtus ferruginea, sparsissime et in venis tantum paulum densius pilosa, nervi principales utrinque ad 16, petioli 6 ad 9 cm longi, basi 8 mm lati, laminae 18 ad 22 cm longae, 10 ad 11 cm latae. Inflorescentiae binae ad folium quodque oppositae, longae (ultra 3 cm) pedunculatae, subcorymbosae, pedunculis secundi ordinis in dichasii modum ramosis, 3 cm longis, bracteae cito deciduae, oblongae, obtusae, concavae, pilosae, 1.5 cm longae in ramis junioribus tantum observandae, pedicelli 1 cm longi. Calyx campanulatus, medium usque fissus, lobis triangulis acutis, divergentibus, 6 mm longus, glaber ut exceptis bracteis ceterum tota inflorescentia. Corolla campanulata, lobis paulum evolutis (mihi non bene visis) 1.3 cm longa, ampla, glabra. Stamina infra medium tubum affixa, filamentis modice curvatis; ovarium elongatum, attenuatum, discus satis magnus, integer, stigma

magnum, stylus stamina paulum excedens. De colore nil constat. Fl. Junio.

LUZON, Province of Albay, Mount Mayon, *Bur. Sci. 2928 Mearns.*

A striking species, and in full flower certainly a beautiful plant. It is undoubtedly allied to *C. dispar* C. B. Clarke, which it resembles even to its slender, elongate ovary. I observed in this species small cleistogamous flowers with globose ovaries, short styles, well developed stamens and quite rudimentary corollas.

CYRTANDRA GLABRA Kränzl. sp. nov. (§ *Polynesiae*).

Frutex 1.5 m altus, rami tetragoni, glaberrimi, cortice pallide luteo, subtus nitido, superne fusco, glabro tecti, breviter fractiflexi, internodia 2 ad 3 cm longa. Folia opposita, plus minus (interdum valde) inaequalia, longe petiolata, superne et subtus necnon petioli omnino glabrus, oblongo-lanceolata, acuta vel acuminata, margine remote et paucidentata, dentibus obtusis, petioli 2 ad 3 cm longi, laminae ad 10 cm longae, 4 ad 5 cm latae, plerumque minora, nervi principales utrinque 7 vel 8. Inflorescentiae pedunculatae, floribus in dichasium typicum pauciflorum dispositis, bracteae cito deciduae, mihi von visae, pedunculi circ. 2.5 cm longi pedicellique breviores tenuissimi, filiformes. Calyx ample campanulatus, post anthesin praestans, lobis brevibus triangulis, 3 mm longus et diam., glaber. Corolla campanulata, recta, lobis labii superioris parvis, acutiusculis, illis labii inferioris majoribus rotundatis, tota corolla 1 cm longa, 5 mm diam. Stamina medio in tubo affixa, filamentis valde curvatis; ovarium subglobosum, glabrum, discus in annulum reductus, stylus antheras attingens, e basi tenui incrassatum in stigma pro flore maximum, tubi diametro fere aequale dilatatum. Bacca globosa, verrucosa (an siccitate) intense purpurea, ut videtur valde succosa. Flores purpurascentes (?), certe non albi. Fl. Novembri.

MINDORO, Mount Halcon, *Merrill 5770,* an undershrub in forests, altitude about 1500 m.

The most striking character of this rather commonplace looking plant is its entire lack of pubescence. Not even the nerves on the lower surface of the leaves, the petioles, or the styles show any traces of hairs, parts of the plant that in comparatively glabrous species of *Cyrtandra* show traces of pubescence.

CYRTANDRA CYCLOPUM Kränzl. sp. nov. (§ *Dispares*).

Frutex, cujus summitates tantum adsunt, rami leviter fractiflexi, tenues, superne brunneo-pilosi. Folia alternantia, altero nempe in rudimentum lineale, minutum reducto, obovato-lanceolata vel oblonga, acuta, margine remote dentata, basin versus integra, superne nigrescentia glabra, subtus pallidiora brevi-pub-

escentia in nervis tantum longius pilosa, margine non fimbriata, maxima mihi visa cum petiolo 5 ad 8 mm longo ad 11 cm longa, 2.5 ad 3.5 cm lata, minima ad 6 cm longa, ad 2 cm lata. Flores ex axillis rudimentorum orientes (semper ?) singuli, floribus lateralibus plerumque omnino obsoletis; pedunculi 1 cm longi, dense pilosi, bracteae 2 oppositae, lineares, 1.5 cm longae, (addito interdum alabastro 1 in axillis). Calyx brevi-campanulatus, lobis linearibus multo longioribus quam pars basalis, 1.2 cm longus (lobi 8 ad 9 mm), longe pilosus. Corolla calycem plus duplo superans, ad 2.5 cm longa, extus pilosa, manifeste biloba, lobi labii superioris majores, late oblongi, rotundati, illi labii inferioris bene minores, ovati, acutiusculi. Stamina in dimidio inferiore tubi, stylus setosus, aequilongus, omnia vix 1 cm longa, discus pro ovario altus, margine integer. Flores certe albi. Fl. Martio.

NEGROS, Canlaon Volcano, *Banks s. n.*

A rather uninteresting species which at first sight recalls half a dozen others. The principal character by which it can be distinguished is its strongly bilabiate corolla in contrast to the more or less actinomorphic ones of other species of *Cyrtandra*. The deeply cleft calyx is another good character.

CYRTANDRA CHAVIS-INSECTORUM Kränzl: sp. nov. (§ *Dispares*).

Fruticulus squarrosus, ramuli tortuosi, leviter nodosi, interdum fractiflexi, superne tomentosi, maxima pro parte glabri, internodia 1 ad 2.5 cm longa. Folia petiolata, omnia alterna, altero omnino obsoleto, late obovato-oblonga, brevi-acutata, basi mox rotundata, mox brevi-acutata ut in apice, margine excepta parte basali remote dentata, superne glabra, subtus minute et adpresse in nervis tantum paulum densius fuliginoso-pilosa, nervis majoribus utrinque 7 vel 8, maxima cum petiolo 2 cm longo 18 cm longa, antice 6 cm lata, minina (?) ab insectis adeo injuriata, ut de magnitudine nil certi proferre possim. Inflorescentiae satis longe pedunculatae, capitatae, pauciflorae, pedunculi ad 3 cm longi, tenues, bracteae satis magnae, basin usque liberae, tamen cyathum ludentes, oblongae, acutae, extus dense pilosae, maximae 8 ad 9 mm longae, 3 ad 4 mm latae, calycem superantes. Calyx campanulatus, profunde fissus, lobis ovatis, longe acuminatis, longe pilosus, ad 7 mm longus, lobi 5 mm. Corolla urceolaris vel cylindracea, recta, lobis pro tota corolla satis magnis, late oblongis, rotundatis, ad 10 mm longa, lobis 3.5 longis et latis. Stamina fere medio in tubo vel paulum infra affixa, filamentis valde curvatis, ostium tubi non attingentia. Stylus dimidium tubi attingens, dense setosus, stigma crassum,

bilobum, ovarium ovatum, dense pilosum, discus satis altus, margine integer. Flores albi. Fl. Julio.

MINDANAO, District of Lanao, Camp Keithley, *Mrs. Clemens 650.*

Insects must be very fond of the leaves in all stages, for I do not remember any *Cyrtandra* with leaves destroyed to such an extent by insects. If the leaves were opposite the plant could be compared with species of the § *Polynesiae, Cyrtandra triflora* Gaudich. and *C. Garnotiana* Gaudich, for instance, being similar in size, leaves and flowers, but even excepting the characters of the leaves there are discrepancies enough to place our plant in quite another section. The closer affinities among the § *Dispares* are very difficult to point out, and I believe that the whole section will have to be broken up when the genus is revised as a whole.

CYRTANDRA SCANDENS Kränzl. sp. nov. (§ *Radiciflorae*).

Fruticulus 1.25 m altus, epiphytus vel in cortice arborum affixus, scandens. Caulis lignosus, parsim radicibus obsitus, basi circ. 7 ad 8 mm crassus, supra attenuatus ibique fusco-pilosus, internodia 1 cm longa. Folia in apice caulis congesta ad 8, petiolata, lanceolata, basi et apice acuminata, margine integerrima, superne opaca, glabra, subtus glabriuscula, in nervis tantum paulum densius fulvo-pilosa, petiolis multo densius pilosis, maxima quae vidi, cum petiolo circ. 2.5 cm longo ad 23 cm longa, 5 cm lata, minimum cum petiolo 2 cm longo 10 cm longum, 2 cm latum. Inflorescentiae in parte inferiore aphylla caulis radicibus oppositae, pedunculi brevissimi, vel vix ulli, pedicelli 2.5 cm longi, fusco-pilosi. Calyx glaber, profunde fissus, amplissimus, patens post anthesin persistens, segmenta ovata, acuta, 1.3 cm longa, 3 ad 4 mm lata. Corolla recta vel vix curvata, e basi haud ita angusta ampliata, lobis brevibus inter se vix diversis retusis, extus longe pilosa, 2 cm longa in orificio 8 mm diametro. Bacca oblonga, interdum calyce obcelata, interdum nuda, stylo brevi coronata, 1.2 cm longa, 6 ad 7 mm crassa. Flores purpurei. Fl. Aprili.

MINDANAO, Province of Surigao, *Bolster 326*, altitude 120 m.

The calyx somewhat resembles that of *Aeschynanthus obconica* C. B. Clarke, and is deeply divided. Each flower apparently produces a berry, which, as the flowers are inconspicuous, is a rather singular character.

CYRTANDRA HYPOCHRYSOIDES Kränzl. sp. nov. (§ *Polynesiae*).

Frutex volubilis. Caulis quadrangulus, sulcatus, dense ferrugineo-villosus. Folia internodiis valde diversis sejuncta (2.5 ad 6 cm longis) opposita, parum dissimilia, brevi-petiolata, oblonga, basi et apice brevi-acutata, margine fere toto brevi-dentata, superne opaca sparsim longeque pilosa, subtus pallidiora sericeo-pilosa prasertim in nervos, quorum utrinque 7 ad

8 praestant, folia juniora aureo-nitida, petioli omnium densius pilosi quam laminae, maxima, quae vidi, cum petiolo 2 cm longo 22 cm longa, 6 cm lata, minima cum petiolo 1 cm longo 11 cm longa 4.5 cm lata. Inflorescentiae brevi-pedunculatae, dichasiales, pauciflorae, pedunculi pedicellique 1 cm longi, ipsi necnon calyces dense ferrugineo- vel fere aureo-villosi, nitidi, bracteae late lanceolatae pro floribus magnae. Calyx profunde fissus, deciduus, segmenta ovato-oblonga, acuta, 5 ad 6 mm longa, extus longe pilosa. Corolla perfecta mihi non visa, ex notulis collectoris alba leviter purpureo-suffusa esse dicitur, leviterque suaveolens. Bacca latissime ovata, fere globosa, 7 ad 8 mm longa, 6 mm diam. Fl. Martio, Aprili.

LUZON, Province of Zambales, Mount Pinatubo, *Bur. Sci. 2543 Foxworthy.* PALAWAN, Mount Victoria, *Bur. Sci. 650, 687 Foxworthy*, altitude about 1520 m.

The plant resembles *Cyrtandra hypochrysea* Kränzl., but differs in its larger leaves, its pubescence not so golden-yellow but more brownish, shorter inflorescence, and, so far as I can judge from the calyx, larger flowers. I have seen no corolla, but in some of the calyces examined in the hope of finding at least young corollas, the four short leaflets so characteristic of cleistogamous flowers were observed.

CYRTANDRA TAYABENSIS Elmer Leafl. Philip. Bot. 1 (1908) 347.

Arbol vel frutex elatus. Rami teretes, inferne glabri, deinde fusco-piloso, in apice cum foliis novellis fuliginoso-villosi; internodia 5 ad 6 cm longa. Folia opposita, consimilia, longe petiolata, oblonga, acuta vel acuminata, minute remoteque dentata, superne opaca, glabra, subtus pallidiora (sicca pallide ferruginea), nervis utrinque 8, glabra exceptis venis sparsim ferrugineo-pilosis; petioli 3.5 ad 5 cm longi, laminae ad 15 cm longae, ad 7 cm latae. Inflorescentiae brevissimae in axillis petiolorum conglomeratae (unde nomen !) pauciflorae (3 ad 5), pedunculi pedicellique brevissimi, densissime fuliginoso-villosi. Calyx basin usque divisus, lobi ovato-trianguli acuminati, extus sparsim pilosi, 1 cm longi, basi 2 mm lati paulum ringentes. Corolla extus densissime pilosi, tubulosa vel urceolaris, non curvata, in lobos 5 inter se vix diversos ovato-triangulos, obtusos divisa, 1.5 cm longa. Stamina brevissima, in superiore parte tubi, antherae magnae, staminodia minuta. Ovarium oblongum, discus satis altus, margine minute dentatus; stylus breviusculus sparsium pilosus, stigma magnum, bilabiatum. Fructus mihi non visi. Flores rosei. Fl. Julio.

LUZON, Province of Laguna, Paete, *Bur. Sci. 10048 Ramos.*

In general appearance very near to *Cyrtandra triflora* Gaudich., of Hawaii, but at once distinguished by its very short inflorescences. The

rather wide, campanulate calyx is very curious. The corolla is small and pink and is not conspicuous. According to C. B. Clarke the § *Apertae* and § *Macrosepalae* are confined to the Hawaiian Islands, but this species is so similar to *Cyrtandra triflora* Gaudich. that we must extend the range of the § *Apertae* to the Philippines. I am now of the opinion that it would be best to unite those species of § *Macrosepalae* with narrow calyx-segments with the § *Apertae* and to confine to the § *Macrospalae* only those species with enlarged, spathulate or foliaceous calyx-segments.

CYRTANDRA MIRABILIS Kränzl. sp. nov. (§ *Radiciflorae? Dissimiles?*)

Frutex 1.25 m altus. Partes basilares et radices desunt. Rami novelli stricti, nodosi, cicatricibus foliorum valde prominentibus praediti, intense ferrugineo- vel cupreo-villosi, folia lanceolata vel oblongo-lanceolata, remote dentata, superne opaca, glabra, subtus ferrugineo-villosa, foliis junioribus cupreo-sericeis, maxima ad 17 cm longa, 4.5 cm lata, alterum cujusque paris paulum minus quam oppositum. Rami ut videtur serius aphylli, decumbentes (?), postremo floriferi internodiis multo elongatis (1.5 ad 2.5 cm in ramis foliatis ad 5 cm in ramis aphyllis). Inflorescentiae 3 ad 4 cm diametro, pluriflorae, juxta nodos foliorum dejectorum orientes, fasciculatae, pedunculus communis circ. 1 cm longus, mox in ramulos paucifloros dissolutus, flores ipsi sessiles, e bracteolis minutissimis orientes, certe succedanei et in modum cincinni dispositi, ramuli saepius iterum ramosi, haec omnia necnon calyces, fuliginoso-pilosi. Calyx basi campanulatus in lobos longos lineares divisus, 7 ad 8 mm longus (lobi 6 ad 7 mm). Corolla quam calyx subduplo longior, 1.2 cm longa, lobi labii superioris parvi, illi labii inferioris majores oblongi rotundati, omnes inter se parum diversi, tota corolla sparsissime pilosa. Stamina 2, filamentis valde curvatis, antheris conglutinatis orificio tubi approximatis, ovarium longe attenuatum, stylus crassiusculus dense setosus, discus satis altus, margine integer, Bacca elongato-ovata, maturam non vidi. Flores rosei. Fl. Julio (sed certissime multos per menses).

MINDANAO, District of Davao, Santa Cruz, *Williams 3012*, altitude about 600 m.

This is one of the most extraordinary species of the genus. In general habit it resembles the § *Radiciflorae* and I believe that ultimately it must be placed here. There are, however, some characters, such as the color of the flowers, which seem to place it in *Dichrotrichum*, but the flowers have two stamens. The most singular character is the inflorescence. It arises from defoliated elongate stems; from a basal peduncle 20 or more branchlets arise, which produce serially, and apparently at long intervals, the small flowers which are cincinnously arranged. It is impossible to study to advantage all the peculiarities in dried material, and I can only recommend the study of all these morphological details to those who have opportunity to examine the plant in a living stage.

CYRTANDRA TECOMIFLORA Kränzl. sp. nov. (§ *Radiciflorae*).

Frutex epiphyticus? Caulis lignosus, radicibus obsitus, erectus, apice tantum foliatus, sordide brunneo-pilosus. Folia opposita aequalia vel vix diversa, elongato-lanceolata, acuminata, in petiolum angustata, basi integra, deinde remote dentata, superne livida vel glauca, scabriuscula, ceterum glabra, subtus lutescentia, breviter adpresseque in nervis tantum et in margine densius pilosa, ad 15 cm longa, plus minus 3.5 cm lata. Inflorescentiae radicibus oppositae pauciflorae, dichasiales, pedunculi circ. 1 cm longi, bracteae minutae, lineares, pedicellos non aequantes, brunneo-pilosae ut etiam pedicelli longiores. Calyx longe campanulatus, basi rotundatus, lobi parti integrae aequilongi, ubique pilosus, lobi margine glabri, acuminati, totus calyx 2 cm longus. Corolla leviter curvata, ampla, illis Tecomae cujusdam vel Bignoniae persimilis, lobis magnis semiorbicularibus, extus ubique sericeo-pilosa, in ostio glabra, ad 4.5 cm longa, in orificio circ. 2.5 cm diametro. Stamina fere 3 cm longa, filamenta medio dilatata. Stylus multo brevior, satis crassus, vix 2 cm longus. Flores albi, tenerrimi, diaphani. Fl. Januario.

MINDANAO, District of Zamboanga, near Port Banga, *For. Bur. 9264 Whitford & Hutchinson*, in forested ravines, altitude about 40 m.

The specimen at hand is the upper part of a branch of probably an epiphytic plant. Except in its rather rigid habit it resembles Clarke's figure of *Cyrtandra radiciflora*. The flowers are larger and more beautiful than in any other known species of the section. A singular character is the absence of hairs on the calyx-lobes.

CYRTANDRA LIVIDA Kränzl. sp. nov. (§ *Dissimiles*).

Planta herbacea, ad 25 cm alta. Caulis squarrosus, pauciramulosus, glaber. Folia opposita, plus minus inaequalia, oblonga, acuta, in petiolum brevem angustata, excepta tertia parte basilari margine dentata, livida vel albescentia, petiolis pilosis, maxima cum petiolo 1 cm longo ad 14 cm longa, 4.5 cm lata, minima (opposita) ad 7 cm longa, 3 cm lata, nervi paulum prominentes non densius pilosi. Flores (ut videtur semper) singuli ex axillis foliorum multo minorum medio in caule orientes, bracteae minutissimae pedicellos vix aequantes. Calyx elongatus, anguste tubulosus, apice tantum in lobos 5 parvos triangulos divisus, brevipedicellatus, ad 1.2 cm longus, longe pilosus, lobi brevi-trianguli, rotundati, brevi-apiculati. Corolla e basi angusta primum cylindracea sensim ampliata, longe pilosa, recta, lobis parum evolutis, rotundato-retusis, 3 cm longa, in orificio 1.5 cm diametro. Stamina circ. 2.5 cm longa, antheris cohaerentibus, stylus 2 cm

longus. Flores albi, pallide roseo-sufusi, intus maculis luteis decori. Fl. Martio, Aprili.

PALAWAN, *Bur. Sci. 781 Foxworthy*, in dry ravines on hillsides.

The flowers are described without actual dissection, as in the specimen examined they are glued to the paper and any attempt to remove them might have resulted in their destruction. The stamens and style are to be seen clearly through the corolla, but I was unable to see the disk.

CYRTANDRA LIMNOPHILA Kränzl. sp. nov. (§ *Decurrentes* ?).

Caulis longissimus, in solo humido prorepens, pars, quae adest, ad 10 cm longa, tetragonus, ubique radicans, saepe per internodia quaedam radiculis densissimis brevibus obsitus, parsim radices longos emittens, rami et apex caulis adscendentes, internodia circ. 4 ad 5 cm longa. Folia opposita subaequalia, in petiolum longum sensim angustata, obovato-lanceolata, brevi-acutata, praesertim apicem versus paucidentata, superne opaca, glabra, subtus pallidiora, scabrida, secus nervos fulvo pilosa, maxima cum petiolo ad 20 cm longa, 3.5 cm lata, minima 5 ad 6 cm longa, circ. 1 cm lata. Inflorescentiae paucae in parte adscendente rami, ex axilla folii persistentis orientes, triflorae, pedunculi pedicellique brevissimi, ipsi cum calycibus dense pilosi, bracteae oblongae, persistentes. Calyx campanulatus, brevilobus, lobis ovato-triangulis, acutis, 1.2 cm longus, lobis 2 mm longis, extus pilosus. Corolla jam a basi satis ampla, campanulata, supra paulum patente (?), lobi late oblongi rotundati, margine minute denticulati, tota corolla extus longe pilosa, circ. 3.8 cm longa, basi 5 mm, basi paulum ultra 1 cm diam. Stamina tubum subaequantia, stylus vix semilongus. Ovarium breve, discus 5-lobus, altero latere altior (?). Flores albi. Fl. Decembri.

LUZON, Province of Pampanga, Mount Abu, *Bur. Sci. 1988 Foxworthy*, in the mossy forest, altitude about 1400 m.

This is a singular plant, with characters partly and perhaps mostly of the § *Decurrentes*, but with some characters of the § *Radiciflorae*. The material available for examination was imperfect, and the only flower at my disposal a bud nearly at stage of anthesis. While this presented the principal internal and external characters, it did not, of course, show the position of the lobes of the open flower.

CYRTANDRA GEANTHA Kränzl. sp. nov. (§ *Radiciflorae*).

Frutex? Caulis lignosus, certe partim repens, de altitudine e membris disjectis speciminis unici aliquid certi proferre non audeo, sed altus videtur, inferne glaber, superne dense ferrugineo-pilosus, internodia inter 2 (superne) et 7 cm varia. Folia satis longae petiolata, oblonga, basi rotundata, apice acuta, margine integra vel vix remotissime dentata, superne rugulosa, subtus

ubique dense ferrugineo-villosa, non solum in venis ceterum valde prominentibus, folia juniora dense lanata, maxima mihi visa cum petiolo ad 2 cm longo ad 18 cm longa, 5 cm lata, textura duriuscula, fere coriacea. Inflorescentiae pauciflorae dichasiales, pone radices in solo ipso ex axillis cataphyllorum (?) orientes, pedunculi pedicellique brevissimi, pilosi. Calyx tubulosus vel cylindraceus, 1.5 cm longus, dense brevique ferrugineo-pilosus, lobi brevissimi, trianguli, acuti. Corolla calycem plus duplo superans, ultra 3.5 cm longa, extus et intus praesertim longe pilosa, lobi magni oblongi, obtusi, inter se parum diversi. Stamina 3 cm longa, antherae conglutinatae at facile separandae; stylus aequilongus, stigma latissimum, discus satis altus, superne integer. Bacca fusiformis (immatura ?), 1.3 cm longa, stipitata. Flores certe albi. Fl. Julio.

MINDANAO, Lake Lanao, Camp Keithley, *Mrs. Clemens s. n.*

A plant quite similar to the two preceding species, but covered throughout with a rusty tomentum. The inflorescences are few-flowered, and the flowers have long hairs within. The flowers arise just above the surface of the ground as in *Lathraea clandestina.*

CYRTANDRA SALIGNA Kränzl. sp. nov. (§ *Radiciflorae*).

Radices multiramosi, lignosi. Caules 30 ad 45 cm alti et forsan altiores, stricti, graciles, foliosi, obscure quadranguli vel teretes, inferne glabri, apicem versus sparsim fuliginoso-pilosi, internodia inferne 3 cm, superne vix 1 cm longa. Folia opposita, petiolata, lanceolata, in petiolum sensim angustata, acuminata, margine integra vel remote dentata, superne glabra, subtus solummodo secus nervos (incluso petiolo) fulvo-pilosa, margine ciliata, maxima cum petiolo 2 cm longo ad 18 cm longa, medio 3 ad 3.5 cm lata, apicali minora, praesertim angustiora. Inflorescentiae certe ex axillis foliorum dejectorum in infimis partibus caulis orientes, cymoso-dichasiales, pedunculi 1.5 cm longi, pedicelli secundi et tertii ordinis 1.2 cm ad 1 cm longi, omnes minute pilosi, bracteae omnes minutissimae. Calyx longiusculus, cylindraceus, 1.8 ad 2 cm longus, lobi trianguli, acuti, quartam partem calycis aequantes, 5 mm longi. Corolla calycem plus duplo superans, anguste cylindracea, 3.5 cm longa, apice paulum dilatata, extus longe pilosa, de forma loborum aliquid certi proferre non audeo, floribus nimium destructis; stamina longa, antherae ab insectis devoratae; ovarium anguste oblongum, discus satis altus, integer, stylus cum stigmate magno 2.5 cm longus. Bacca semimatura (?) 2 cm longa. Flores tenerrimi, albi vel roseo-suffusi. Fl. Octobri.

MINDANAO, District of Zamboanga, near Zamboanga, *Merrill 5480*, at the base of cliffs in shaded ravines, altitude about 100 m.

The whole plant much resembles a young shoot of *Salix* with somewhat luxuriant leaves. The flowers are borne in a dichasially branched fascicle from the very base of the plant just above the ground, not a favorable position for such fragile and tender corollas. I could not make out the outlines of the corolla-lobes, as the specimen was gathered a little too late. Most of the flowers showed young berries, and the numerous fertilized flowers are rather remarkable in contrast with *Cyrtandra strongiana* Kränzl.

CYRTANDRA STRONGIANA Kränzl. sp. nov. (§ *Radiciflorae*).

Caulis satis crassus, certe humifusus, radicans; rami adscendentes, foliati, ad 10 cm alti, laxi, fuliginoso-villosi. Folia opposita, petiolata, oblonga vel oblongo-lanceolata, subfalcata, acuta vel acuminata, superne opaca, scabriuscula, subtus fuliginoso-pilosa, praesertim secus nervos, ceterum parum prosilientes, margine remote serrata, maxima ad 17 cm longa, 4.5 cm lata, pleraque minora. Rami floriferi e caule repente secus radices orientes, ad 30 cm alti vel altiores, ramosissimi, ramis ad 10 cm longis, cortici pallide brunneo, fragili tecti, aphylli. Flores parvi, distichi, (alabastris interdum ab insectis injuriatis, in strobos minutissimos mutatis), bracteae parvae, deciduae; pedunculi pilosi, 5 mm longi. Calyx extus hirsutus, profunde, fere basin usque, partitus, lobis triangulis aristatis vel longissime attenuatis, teretibus, totus calyx 8 mm longus, pars integra basilaris circ. 2 mm. Corolla calycem paulum superans, labium superius minute bilobulum, rotundatum, ceteri lobi orbiculares, tota corolla sparsissime pilosa, 1.3 ad 1.5 cm longa, lobi 4 mm diam. Stamina 2, antheris conglutinatis orificium tubi attingentibus; ovarium oblongo-ovatum, glabrum, discus satis altus, margine integer; stylus breviusculas antheras non attingens. Bacca stylo curvulo coronata rugulosa. Flores lavandulaceo-purpurei. Fl. Septembri.

MINDANAO, Lake Lanao, Camp Keithley, *Mrs. Clemens 1094*.

A very singular plant; a shrub 2.5 m. in height according to the collector. The inflorescences are the most remarkable in the family, composed of slender, weak, flexible branches bearing small buds of apparently succedaneous flowers. The foliage and flowers present all the characters of a true *Cyrtandra*. The three specimens examined were composed of several pieces each, but showed a plant somewhat similar to *Cyrtanda radiciflora* C. B. Clarke.

CYRTANDRA STENOPHYLLA Kränzl. sp. nov. (§ *Decurrentes*).

Caulis repens, radicans, breviusculus, inter folia tantum brunneo-pilosus, ceterum cortice griseo, sordido vestitus, ad 10 cm altus vel vix altior. Folia apicem caulis versus congesta, 12 ad 15, opposita, linearia vel lineari-obovata, angusta, basin versus angustata, sed non proprie petiolata, margine plus minus crenato-dentata, apice obtusissima, superne obscure glauca, subtus pallide

viridia, secus nervos pulchre reticulatos fuliginoso-villosa, maxima ad 10 cm longa, 2 cm lata, pleraque ad 8 cm longa, 1 cm lata. Cymae brevissimae, axillares, pedunculi subnulli, bracteae textura et colore foliaceis, brevissimae, pedicelli breves. Calyx brevicampanulatus, angustus, 1 cm longus, dimidium usque fissus, longe pilosus. Corolla alba, infundibuliformis, e basi angusta sensim ampliata subregularis, lobis vix diversis parum evolutis rotundatisque, extus longe pilosa, cum parte in calyce abscondita 3.8 cm longa, in orificio 2.5 cm diam. Stamina circ. dimidium corollae attingentes; ovarium breve ovatum, stylus 2.5 cm longus, stigma parvum. Fructus mihi non visi. Fl. Aprili.

NEGROS, Canlaon Volcano, *Merrill 7008, For. Bur. 4259 Everett.* LUZON, Province of Tayabas, Paete-Piapi, *For. Bur. 9533 Curran.*

I am not entirely satisfied with my diagnosis, the material being rather poor. The plant is apparently rather attractive, and the flowers apparently expand at intervals, in the axils of the crowded leaves. The flowers, for a dwarfed plant, are large. The leaves are dark-green with a bluish tinge on the upper surface and decorated with a network of brownish veins on the lower surface. I have not seen the fruit, nor was the disk examined on account of the paucity of flowers for study.

CYRTANDRA ARBUSCULA Kränzl. sp. nov. (§ *Decurrentes*).

Fruticulus parvus, facie arboris parvae. Radices multiramosi, lignosi, caulis ad 30 cm altus, simplex, lignosus, internodia 2.5 ad 3 cm longa. Folia in apice caulis congesta ad 8, internodiis ibi brevissimis caule in apice breviter denseque piloso. Folia vix petiolata, e basi angusta sensim dilatata fere linearia, apice subito brevi-acutata, margine dentata, dentibus apicem versus magis approximatis majoribusque, superne scabriuscula, ceterum glabra, juniora subtus fuliginoso-villosa, praesertim secundum nervos, adulta solummodo ad nervos, margine ciliata, maxima quae vidi, ad 13 cm longa, 2 cm lata. Cymae dichasiales, triflorae, quam folia multo breviores, pedunculi pedicellique brevissimi. Calyx 8 ad 9 mm longus, anguste cylindraceus, extus sparsim pilosus, lobis triangulis acuminatis, ad 4 mm longis. Corolla per duas tertias tenui-cylindracea, deinde sensim paulum ampliata, non proprie infundibuliformis, lobis antice rotundatis vel imo retusis, undulatis, crenulatis, 2 paulum acutioribus, sed etiam illis obtusis, tota corolla extus pilosa, alba, cum parte in calyce abscondita ad 4 cm longa, in orificio 1 ad 1.2 cm diam. Stamina et stylus circiter dimidium corollae attingentes, stylus longe setosus, ovarium oblonge ovatum, discus satis altus, minute quinquelobus. Flores Martio.

LUZON, Province of Cagayan, *Bur. Sci. 7428 Ramos.*

Another species of the little group of Cyrtandras characterized by short stems, the leaves crowded at the top of the stem, and mostly 3-flowered

inflorescences arising from the axils of the leaves, the flowers being large and conspicuous, white, very hairy, and more or less funnel-shaped. The specific name is taken from the slight resemblance of the species to a dwarfed tree.

CYRTANDRA INFANTAE Kränzl. sp. nov. (§ *Dispares*).

Frutex 50 cm altus. Caulis subquadrangulus superne brunneo-pilosus, apice dense, infra sparsius foliatus. Folium alternum ad rudimentum reductum, in superiore parte caulis, ubi folia congesta, difficillime inveniendum. Folia vix vel brevissime petiolata, obovato-lanceolata, acuta, rarius acuminata, toto margine serrata, superne glabra, opaca, subtus pallidiora, paucivenosa, secus nervos fuliginoso-pilosa, pleraque leviter falcata, rarius recta, 18 ad 32 cm longa, ad 6 cm lata. Inflorescentiae dichasiales, triflorae, brevissimae; pedunculis subnullis, pedicellis perbrevibus, bracteae lanceolatae, 1.5 cm longae, sparsim pilosae. Calyx e basi angustissima infundibuliformis, in lobos triangulos acuminatos divisus, fere 2 cm longus, lobis aequilongis inclusis. Corolla e basi angusta ampliata, sensim dilatata, ore obliquo in lobos 5 subaequales, acutos diviso, extus hirsuta, 4.5 cm longa, ad orificium 2.5 cm diam., alba; stamina ad duas tertias tubi longa; stylus aequilongus, circ. 3 cm longus. Fructus mihi non visi. Fl. Augusto.

LUZON, Province of Tayabas (Infanta), Anoling River, *Bur. Sci. 9320 Robinson*, "very common in this locality but only this one plant in flower."

Robinson states that the leaves are crowded on the upper one-half of the plant, and for this reason it looks like some species of *Elatostema*, the serrate-leaves also resembling those of species of this genus. The only flower available was perfectly dried, but was gummed to the paper. Fortunately the corolla is so transparent that the stamens and style could be seen very well, but no attempt was made to examine the disk and ovary.

CYRTANDRA CHIRITOIDES Kränzl. sp. nov. (Sect. dubia).

Herba, radicibus copiosis praedita, vix 10 cm alta, internodia 1 ad 1.5 cm longa, pars inferior et mediana caulis glabra, summitas tantum fusco-villosa. Folia petiolata, toto ambitu oblonga, acuta, margine crenato-dentata, superne opaca, scabrida, subtus breviter et in venis tantum paulum longius pilosa, venis utrinque 6 vel 7, maxima 11.5 cm longa, 3.5 cm lata, infima cum petiolo circ. 1 cm longo 3.5 cm longa 1 ad 1.2 cm lata. Flores terni in axillis foliorum superiorum. Calyx pro flore parvus cylindraceus, brevilobus, lobis triangulis acutis, extus sparsim pilosus, circ. 1 cm longis. Corolla inter maximas generis e basi perangusta infundibuliformis, antice valde ampliata, lobis 5 magnis, oblongis, rotundatis, patentibus, illis labii superioris paulum minoribus, tota corolla pilis hyalinis vel albidis dense vestita, alba, 4.5 cm

longa, in orificio 2 ad 2.5 cm lata. Stamina longa duas tertias tubi aequantes, satis distantes. Stylus aequilongus, circ. 3.5 cm longus. Fructus mihi non visi. Fl. Octobri, Novembri.

POLILLO, *Bur. Sci. 10257 McGregor.*

The plant is a true *Cyrtandra* and cannot be referred to any other genus of the family, if we take into consideration all characters. From examination of the flowers only one might consider it to be a *Chirita*, flowers of its size being quite extraordinary in *Cyrtandra*. A *Chirita*, moreover, so far east, would be highly surprising, the genus being confined to India, the adjacent parts of China, with a few species in the western Sunda Islands.

CYRTANDRA GLAUCESCENS Kränzl. sp. nov. (§ *Jackianae ?*).

Caulis abbreviatus, radicosus, internodia brevissima, foliis dense congestis, inter se parum diversis, caulis et basis foliorum dense tomentosi. Folia brevipetiolata e basi cuneata obovato-oblonga, obtusa, toto margine a basi brevi-dentata, superne glaucescentia, pilis longiusculis basi pellucidis sparsim vestita, subtus nervis multis, reticulatis, sparsim vestita, subtus nervis multis, reticulatis, sparsim puberulis decora, ceterum pallide ferruginea, cum petiolo 2 cm longo ad 19 cm longa, 3.5 cm lata. Inflorescentiae breves, axillares, ceterum ab insectis praecipue secus basin pedunculorum et bractearum destructae, ut e fragmentis judicandum brevi-cymosae, triflorae. Calyx tenui-cylindraceus, 1 cm longus, lobis anguste triangulis, 4 mm longis, extus longe pilosus. Corolla e basi perangusta sensim infundibuliformis, superne in lobos inter se vix diversos, late triangulos divisa, extus longe et sparsissime pilosa, cum parte basilari in calyce abscondita ultra 4.5 cm longa, in orificio 1.5 cm diametro. Stamina in dimidio superiore tubi; pistillum fere 3.5 cm longum, ovarium 6 ad 7 mm longum, stigma haud magnum, discus annularis. Flores albi. Fl. Martio.

PANAY, Dumarao, *Merrill 6702*, in damp shaded ravines, altitude about 100 m.

Of this species I had for examination a single flower, but no fruit; portions of the leaves and bracts were destroyed by insects. I at first was inclined to place it in the genus *Didymocarpus*, but it seems to be a true *Cyrtandra*. The upper surface of the leaves has the same glaucous hue as in *Cyrtandra cretacea* Kränzl.

CYRTANDRA McGREGORII Kränzl. sp. nov. (§ *Aureae*).

Caulis deest, praestans solummodo folia 2 petiolata, obovata, obtuse acutata, margine minute remoteque dentata, subintegra, nervo mediano subtus valde prominente nervisque lateralibus utrinque 11 ad 12 percursa, superne opaca, glaberrima, subtus in nervis tantum sparsim fulvo-pilosa, maximum cum petiolo circ. 3 cm longo ad 35 longum, quo latissimum 12.5 cm latum.

Inflorescentiae brevi-pedunculatae, in axillis superioribus, ut videtur biflorae, tantum involucro magno vestitae. Folia exteriora involucri late oblonga vel elliptica, margine leviter crenata, nervis longitudinaibus utrinque 1 vel 2, maximum ad 8 cm longum, medio circ. 4 cm latum, supra et subtus glabrum in nervis tantum sparsim pilosum, cetera folia semper minora, ovata, angustiora, omnia obtusa. Flores tenerrimi et cum foliis interioribus involucri adeo compressi, ut salvi separari ne in aqua tepida quidem nequeant, 3.5 ad 4 cm. longi, margine in lobos 1.2 cm longos 6 mm latos, antice rotundatos divisa, tubus sub orificio intus pilosus, de reliquis characteribus floris aliquid certi proferre non audeo. Fl. Augusto.

LUZON, Province of Cagayan, east coast, *Bur. Sci. 10576 McGregor*.

I did not succeed in securing a flower in good condition for analysis as the corolla is very tender and was more or less amalgamated with the calyx and inner bracts of the involucre in drying, so that it was impossible to detach the flower as a whole from the involucre. The species is, however, well characterized by its very large, nearly entire leaves, and especially by its involucres.

CYRTANDRA ALNIFOLIA Kränzl. sp. nov. (§ *Aureae*).

Rami crassi, tetragoni, glabri, cortice fragili tecti, apicem versus brunneo-pilosi, internodia 1 ad 2 cm longa. Folia in apice ramulorum congesta, satis longe (2.5 ad 4 cm) petiolata, oblonga ellipticave, margine remotiuscule dentata, acuta, basi plerumque rotundata, rarius modice acutata, superne glabra, obscurius venosa, subtus glabra in venis tantum sparsim brunneo-pilosa, laminae 10 ad 13 cm longae, 5 ad 6 cm latae. Inflorescentiae brevi-pedunculatae, involucri folia late ovata circ. 4, margine crenulato, dentata, obtusa, textura et indole superne et subtus omnino foliis similia, circ. 4 cm longa, 2.5 cm lata, interiora minora. Flores 2 (certe interdum plura) sessilia. Calyx late campanulatus, a dimidio in lobos triangulos longe acuminatos fissus, lobis in nervo mediano sparsim pilosis, 1 cm longus. Corolla campanulata vel urceolaris, supra in lobos fere orbiculares divisa, extus sparsissime pilosa, intus a basi dimidium usque glabra, a dimidio faucem usque dense brevique pilosa, lobi tamen glabri; tota corolla 1.5 ad 1.8 cm longa, de colore nil constat. Stamina staminodiaque generis manifesta. Ovarium brevi-cylindraceum, glabrum, discus satis altus, brevi 5-dentatus, stylus dense setosus, crassiusculus, stigma magnum. Fructus mihi non visi. Fl. Junio.

LUZON, Subprovince of Benguet, Pauai, *Bur. Sci. 8350 McGregor*, altitude about 2100 m.

The description of this species runs, in part, literally like that of *Cyrtandra populifolia* Miq. (See C. B. Clarke in DC. Monog. Phan. 5: 262.)

There are, however, so many discrepancies between the present species and that of Miquel, that it is impossible to unite them. The material available was in better condition than in most specimens of the § *Aureae*, and the flowers of firmer texture and more easily detached. The leaves bear a certain resemblance to those of some species of *Alnus*.

CYRTANDRA BATAANENSIS Kränzl. sp. nov. (§ *Dispares*).

Frutex vel arbor?, rami tetragoni, cortice passim fragili, passim glabro vel ferrugineo-villoso tecti. Folia ut videtur in apicibus ramorum conferti, 2 ad 3.5 cm inter se distantia, alterum cujusque paris omnino obsoletum, alterum plerumque magnum, e basi angusta cuneato-obovatum, acutum vel rarius obtusum, margine remote brevique dentatum, superne glaberrimum, opacum, subtus pallidius brevissime in nervis densius (sed pro aliis Cyrtandraceis sparsissime) pilosum, maxima quae vidi, 24 cm longa, 6.5 cm lata, minima 13 cm longa, 3.8 cm lata, folia juvenilia densissime villosa, pilis sericeis. Inflorescentiae brevissimae, pauciflorae pedunculi pedicellique villosi, pedicelli 1 cm longi. Calyx longiusculus tubulosus, a dimidio fissus, lobis triangulis, longe acuminatis, 1.2 cm longus. Corolla alba, tubulosa, ultra dimidium subinflata, ostio in lobos 5 magnos, margine undulatos divisa, tota corolla 3 cm longa, extus dense villosa, stylus villosissimus tres quartas tubi aequans, ovarium parvum villosum, discus parvus. Fl. Octobri.

LUZON, Province of Bataan, *For. Bur. 20035 Topacio*, in forests, altitude about 100 m.

It is difficult to determine the exact affinity of this species, although it somewhat resembles *Cyrtandra dispar* DC. The flowers are larger than in DeCandolle's species and it seems that they appear one at a time on the few-flowered, short inflorescence, and although they are showy enough, they are hidden by the very large leaves.

CYRTANDRA UMBELLATA Kränzl. sp. nov. (§ *Polynesiae*).

Frutex, ramus unicus qui praestat 30 cm longus, teres vel vix tetragonus, cortice plerumque glabro, apicem versus tantum brunneo-setoso tectus. Folia opposita aequimagna, internodiis 4 ad 8 cm longis inter se sejuncta, satis longe (1.5 cm) petiolata, late oblonga ellipticave, apice obtusa vel breviacutata, supra glaberrima, opaca, subtus in nervis et margine rufo- vel vulpino-pilosa, ceterum glabra, pallidiora, 6 ad 11 cm longa, 3 ad 5 cm lata, nervis utrinque 8. Inflorescentiae corymbosae, umbellam quam maxime ludentes, longe (9 ad 10 cm) pedunculatae, circ. 10-florae, bracteae florum omnino umbellae involucrum ludentes, lanceolatae, pedicellos 1.3 cm longos semiaequantes, tenuiter fusco-villosae ut etiam calyces pedicellique. Calyx campanulatus,

a dimidio in lobos 5, triangulos, acuminatos divisus, apicibus loborum contractis fere teretibus solidis, post anthesin persistens, 6 ad 7 mm longus. Corolla manifeste bilabiata, ad 12 mm longa, labium superius brevius, brevique bilobulus, labium inferius a superiore bene sejunctum magis productum, lobis lateralibus brevioribus rotundatis, intermedio duplo longiore obovato. Stamina orificium tubi attingentia; annulus ovarii satis altus, margine non lobulatus, ovarium parvum, ovatum, stylus setosus, dimidium tubi subaequans, staminum insertionem vix attingens. Bacca extus rugulosa, stylo persistente coronata, 7 ad 8 mm longa, 5 mm diam. Flores certe albi. Fl. Decembri.

LUZON, Subprovince of Benguet, *For. Bur. 15900 Bacani.*

A species well characterized by its comparatively broad glabrous leaves, and its long-peduncled, umbelliform inflorescence. The flowers are insignificant, and present some resemblances to those of *Cyrtandra trivialis* and *C. plectranthiflora*. The long peduncle is characteristic, and it is probable that other species presenting this character will be found, so that in the future this prominent feature may prove to be useful to designate a small group in the very large § *Polynesiae*. I have maintained the names and limits of the sections as defined by C. B. Clarke, but it will probably be necessary later to break up this large group into smaller natural and geographical ones.

CYRTANDRA TRIVIALIS Kränzl. sp. nov. (§ *Polynesiae*).

Herbacea, annua. Caulis basin versus lignosus, circ. 40 ad 45 cm altus, radicibus longis, copiosis praeditus, a dimidio ramosus, ramis squarrosis. Folia opposita, magnitudine valde diversa, ceterum aequalia, majus petiolatum, minus sessile, toto ambitu lanceolata vel obovato-lanceolata, basin versus vel in petiolum angustata, acuta, margine remote grosse serrata, superne opaca, pilis setosis, basi hyalinis, nitentibus, valde distantibus vestita, subtus pallidiora, in venis tantum et margine fuliginoso-villosa, maxima paris cujusque cum petiolo 1 cm longo ad 10 cm longa, 1.5 ad 2 cm lata, minora ad 3 cm longa, 1 cm lata. Racemi dichasiales, tenuissimi, pauciflori (1- ad 3-flori), pedunculi, pedicelli, bracteae, calyces post anthesin persistentes longe fuliginoso-setosi, pedunculi 2 cm longi, bracteae 7 mm longae, lineares, pedicellos paulum superantes. Calyces basi campanulati, a dimidio in lobos anguste triangulos divisi. Corolla circ. 1 cm longa e basi paulo ampliore angustata, manifeste bilabiata, extus et intus glabra, lobi labii superioris paulum sejuncti breves, obtusi, illi labii inferioris majores suborbiculares, crispuli, margine eleganter crenulati. Filamenta valde curvata; antherae orificium tubi attingentes; stylus gracilis parce glanduloso-pilo-

sus; stigma latissimum orificium tubi aequans. Bacca ovata, rugulosa, calycem persistentem multo superans. Flores certe albi, inconspicui. Fl. Maio.

LUZON, Province of Isabela, *Bur. Sci. 8003 Ramos.*

A rather commonplace-looking species of no more, or even less attractiveness than our species of *Polygonum* and *Lamium* growing in waste places. The undulate and crenulate lower lip of the corolla, however, is a character rarely found in *Cyrtandra.*

CYRTANDRA PLECTRANTHIFLORA Kränzl. sp. nov. (§ *Polynesiae*).

Frutex ramis tenuibus subtortuosis nodosisque, cortice glabro, nitido, fragili, sub apice tantum brunneo-piloso tecti, internodia varia longitudine 1 ad 3 cm longa. Folia opposita, magnitudine plus minus diversa, ceterum similia, petiolata, e basi cuneata lanceolata, acuta vel acuminata, brevidentata, dentibus plus minus remotis, superne opaca, glaberrima, subtus ferruginea in venis longe ferrugineo-pilosa, ciliata, petiolis dense ferrugineo-villosa, maxima cum petiolo 1.5 cm longo 10 ad 13 cm longa, 1.5 ad 2.5 cm lata, minus paris cujusque necnon superiora minora. Inflorescentiae quam folia circ. semilongae, tenues, longe pedunculatae, dichasiales, pedunculi circ. 3 cm, pedicelli 1 ad 1.5 cm longi, sparsim hirsuti, bracteae florum minutae. Calyx campanulatus sparsim pilosus, lobi lineares, quam pars integra sublongiores, totus calyx 7 ad 8 mm longus. Corollae labium superius breviter bilobum ab inferiore manifeste sejunctum, labium inferius longe productum, antice trilobulum, excavatum; tota corolla 1.4 cm longa, extus et intus glabra; stamina brevia, valde curvata; stylus 8 ad 9 mm longus labium superius paulum superans, sparsim glanduloso-pilosum, annulus satis altus bipartitus (?). Bacca rugosa, stylo persistente praedita calycem persistentem bene excedens. Flores albi. Fl. Januario ad Martium.

LUZON, Subprovince of Lepanto, Mount Data, *Bur. Sci. 5945 Ramos:* Province of Cagayan, *Bur. Sci. 7362 Ramos.*

A plant resembling *Cyrtandra ilicifolia* Kränzl. and *C. benguetiana* Kränzl., but distinguished by its long-stalked, few-flowered inflorescences and especially by its long corolla-lip, somewhat resembling the lower lip of a *Plectranthus.* All the characters of the lower lip of the corolla cannot be determined from the material available, as in the flower examined it was somewhat damaged.

ISANTHERA Nees

ISANTHERA DIMORPHA Kränzl. sp. nov.

Rhizoma repens radicibus crebris obsitum. Caules ad 25 cm alti, sordide grisei, excepta parte suprema glabri. Folia omnia alterna, petiolata, subobliqua vel subfalcata, oblonga vel oblongo-lanceolata, obtuse acutata, basi in petiolum angustata, a dimidio

apicem usque remote serrata, superne glabra, opaca, subtus praesertim in venis fulvido-nitidoque villosa, margine ciliata, maxima cum petiolo 2.5 cm longo ad 13 cm longa, 3 ad 3.5 cm lata. Inflorescentiae cymosae in dichasia exeuntes, quam folia vix tertiam partem aequantes, pedunculi pedicellique longe et nitido pilosi, bracteae florales minutissimae. Calyces fere basin usque fissi, lobis linearibus longe pilosis, apice obtusis, 5 ad 6 mm longi. Corollae observantur formae: altera brevi-urceolaris, 4 mm longa, quinque loba, lobis rotundatis margine crenatis, altera in floribus me judice cleistogamis 1 mm longa, foliolis 4 valvatim sese tegentibus, excavatis, orbicularibus composita. Stamina 4, in forma corollifera filamentis leviter tortis, in cleistogama, filamentis multo brevioribus, rectis praedita, antherae in utraque forma magnae, biloculares, rimis parallelis. Ovarium breve, globosum, annulus obsoletus vel vix evolutus, stylus glaber, apice leviter incurvus, stigma minutum. Flores albi (?). Fl. Februario.

LUZON, Province of Laguna, Mount Maquiling, *Merrill 6295*, altitude about 300 m.

A very unattractive species, but at the same time an interesting one. There are two forms of flowers, one without and one with a showy corolla, if a corolla only 4 mm in length can be called showy. In the larger flowers the corolla does not exceed the calyx, and is visible only between the calyx-teeth, while in the smaller flowers it appears like a small globose capsule. The series of dimorphous Cyrtandraceous plants is increasing in number, and here we have a form of special interest as two kinds of flowers are found in the same inflorescence. It should be noted that the stamens in the flowers with the larger corollas are by no means smaller or weaker than in the cleistogamous flowers, and that the styles in the former are perhaps even longer.

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STUDIES ON PHILIPPINE MELASTOMATACEAE, II

By E. D. MERRILL [1]

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

THE TRIBE ASTRONIEAE

This tribe, chiefly of Malayan and Polynesian distribution, is interpreted by Cogniaux [2] as consisting of 5 genera: *Astronia*, by far the largest genus, with about 60 species, extending from tropical Africa, a single species, to Malaya and Polynesia; *Beccarianthus*, a monotypic Bornean genus; *Pternandra*, with 5 species in the Malay Peninsula and Archipelago; *Kibessia*, with 16 species in the Malay Peninsula and Archipelago; and *Plethiandra*, a monotypic Bornean genus. To this must now be added the very distinct Philippine genus *Astrocalyx*, and the less strongly marked one *Everettia*. The genus *Beccarianthus* is, by the description of a second species, extended to the Philippines. Both the genus *Kibessia* and *Pternandra* have been credited to the Philippines, but on erroneously localized or erroneously determined material.

KEY TO THE GENERA

1. Stamens very numerous, about 65 ..... 1. *Astrocalyx*
1. Stamens few, 8 to 12, twice as many as the petals.
   2. Flowers small; filaments short; anthers thick, broadly hatchet-shaped, introrse; stigma capitellate ..... 2. *Astronia*
   2. Flowers large; filaments elongated; anthers narrowly linear; stigma punctiform.
      3. Leaves 3-nerved ..... 3. *Everettia*
      3. Leaves 5- or 7-nerved ..... 4. *Beccarianthus*

1. ASTROCALYX Merrill

ASTROCALYX CALYCINA (Vid.) comb. nov. (Plate XI.)

Astronia calycina Vid. Rev. Pl. Vasc. Filip. (1886) 136; Cogn. in DC. Monog. Phan. 7 (1891) 1095.

Astrocalyx pleiosandra Merr. in Philip. Journ. Sci. 5 (1910) Bot. 203.

LUZON, Province of Laguna, *For. Bur. 22312 Mariano* (leaf specimen only), *For. Bur. 20361 Tabat* (leaf specimen only), *Bur. Sci. 8983 Fox-*

[1] Associate Professor of Botany, University of the Philippines, Manila, P. I.
[2] DC. Monog. Phan. 7 (1891) 1092.

worthy, July, 1909, with nearly mature buds, *Phil. Pl. 1106 Ramos*, September, 1912, in flower and fruit: Province of Camarines, Maniba River, *For. Bur. 14349bis Aguilar*, July, 1909, in flower: Province of Albay, *Vidal 780* in herb. Kew. LEYTE, Dagami, *Bur. Sci. 15384 Ramos*, August, 1912, in flower.

This remarkable monotypic genus is characterized by its elongated calyx-teeth and by its very numerous stamens, the latter a character found in very few genera in the *Melastomataceae*. That *Astronia calycina* Vidal and *Astrocalyx pleiosandra* Merr. are identical is unquestionable, and accordingly the earlier specific name has here been accepted. It is well to note that, manifestly through error, Vidal cites his No. *781* as the type of *Astronia calycina*, while on page 346 of the same work he refers No. *780* to *Astronia calycina* and *781* to *Astronia* sp. In the Kew herbarium *Vidal 780* agrees perfectly with the description of *Astronia calycina*, while *Vidal 781* is a true *Astronia* with small flowers and minute calyx-teeth, and does not agree at all with the description of *Astronia calycina* Vid. Vidal does not describe the flowers, aside from the calyx, and hence in working out the status of my genus *Astrocalyx* I naturally failed to connect the specimens with Vidal's *Astronia calycina*, assuming that he was correct in placing his species in *Astronia*. In November, 1911, Dr. C. B. Robinson examined Vidal's specimen in the Kew herbarium, and supplied me with a carbon rubbing of a leaf, showing its size and characteristic venation. He comments on the specimen as follows: "The calyx-teeth make the specimen the most peculiar thing of the kind I know. It is so unusual that for this reason, though no other, I might have hesitated to call it *Astronia* at all." The leaf impression together with Vidal's description shows conclusively that *Astronia calycina* Vid. is not at all a member of this genus, but is identical with *Astrocalyx pleiosandra* Merr.=*A. calycina* (Vid.) Merr.

2. ASTRONIA Blume

In the latest monograph of the *Melastomataceae*, that by Cogniaux,[3] the genus *Astronia* is credited with twenty-four species, extending from the Malay Peninsula and Archipelago to New Guinea, Fiji, Samoa, and the Society Islands, one-half of the species being known only from Polynesia. Five species are credited to the Philippines, *Astronia calycina* Vid., *A. rolfei* Vid., *A. pulchra* Vid., *A. cumingiana* Vid., and *A. candolleana* Cogn. The list must be reduced by one species, *Astronia calycina* Vid., for additional material shows this characteristic form to belong to the very distinct monotypic genus *Astrocalyx*. Most of the proposed additional species, since the publication of Cogniaux's monograph, have been based on Philippine material, but with the addition of *Astronia borneensis* Cogn., from Borneo, and *A. triplinervia* Cogn., from Amboina, both *nomina nuda*, *A. stapfiii* Koord., from Celebes, and *A. stuhlmanii* Damm., from tropical Africa. Recent botanical exploration of the Philippines

[3] DC. Monog. Phan. 7 (1891).

has brought to light a surprisingly large number of undescribed forms, so that there are at present known from the Philippines alone about as many species of *Astronia* as are otherwise known from the entire range of the genus, that is tropical Africa, Malaya, and Polynesia. In the present consideration twenty-six Philippine species are recognized, and it is confidently expected that additional exploration will yield a considerable number of additional forms.

So far as can be determined at present all our species, with one exception, are confined to the Philippines; *Astronia cumingiana* Vid., a very common and widely distributed Philippine species, has been reported from Celebes by Koorders. Many are apparently of very local occurrence and are at present represented but by solitary or few collections; others are widely distributed in the Archipelago and range from northern Luzon to southern Mindanao. Most of them are found at medium and higher altitudes, although some occur at or near sea-level, especially in those regions where the rainfall is not interrupted by a prolonged dry season. All the species are sylvan. The Province of Laguna, Luzon, presents no less than thirteen distinct species. Seven are found on Mount Maquiling and ten on, or about, Mount Banajao, but although these two mountains, both with forested slopes and both extinct volcanos, are not more than 30 kilometers apart, they possess, so far as our collections show, but four species in common.

The most important character that the present study has demonstrated is that most if not all of the Philippine species are polygamo-dioecious, a character not hitherto given for the genus, and one very rare in the family. It is suspected that the character will be found to hold true for the entire section *Euastronia*. Certain plants bear only staminate flowers, while others bear only perfect ones, the staminate flowers frequently not presenting even a rudimentary ovary. In eighteen of the twenty-six species considered, our collections present species in which the specimens are with male flowers only, or some with male flowers and others with perfect ones, the different kinds of flowers invariably being found on separate specimens. The eight remaining species are mostly represented by only one or two specimens. My attention was directed to this character first by finding on certain specimens only male flowers, and second by attempting to utilize certain calyx characters in the construction of a key. It was discovered that in those specimens presenting a cup-shaped calyx the flowers were invariably

staminate, while in those specimens presenting a more or less urceolate calyx, the flowers were invariably perfect. In no case has the two types of flowers been found on the same specimen. In the determination of species either by direct comparison or by an examination of descriptions, the calyx-character, as to shape, must be used with caution.

There is also, in most of the species, a vegetative character that has apparently not previously been recorded, and that is the presence, on one or both surfaces of the leaf, of small, irregularly disposed, cystoliths or cystolith-like bodies.

The Philippines are apparently a center of distribution for the genus, as indicated by the great number of forms discovered in the Archipelago. In many respects some of the species appear to be more or less in a stage of transition, for intermediate forms frequently occur which it is difficult definitely to refer to any particular species. Characters as to venation, color and persistence of the indumentum, etc., are by no means constant. Consequently it has been found to be somewhat of a task to prepare an analytical key to the species that will always work.

In using the key presented herewith exceptions are to be looked for in the arrangement of the basal nerves. In most of the species the leaves are very definitely 3- or 5-nerved, or 3- or 5-plinerved, but in some apparently both types of venation are found. In determining the number of primary basal nerves some difficulties are encountered due to the usual presence of a pair of slender, sub-marginal nerves, which may be rather distant from the margins and comparatively strongly developed. The indumentum, while very characteristic and very persistent for many species, is in others of comparatively little significance, due to its deciduous or even fugacious character. In one stage of development the leaves may be uniformly lepidote and distinctly colored on the lower surface, and at a later stage be quite glabrous and green. Even the inclusion of the same species under two different heads, in some cases, is not entirely satisfactory. I cannot, however, discover any other characters than those utilized in the construction of the present key that will serve the purpose better.

1. Leaves definitely 7-nerved, up to 30 cm long, green beneath and somewhat lepidote with distinct, scattered, brown scales..... 1. *A. apoensis*
1. Leaves definitely 5-nerved or 5-plinerved, rarely with a very faint submarginal pair added.
   2. Leaves definitely 5-nerved, mostly 15 to 20 cm long, pale-green on both surfaces when dry, with few, scattered, distinct, brown, lepidote scales.

3. Leaves rounded at the base ..... 2. *A. mearnsii*
3. Leaves acute or decurrent-acuminate at the base.
4. Bracts and calyx glabrous or nearly so; petioles nearly glabrous. 3. *A. lagunensis*
4. Bracts and calyx prominently ferruginous-furfuraceous; petioles and inflorescence more or less densely setose ..... 4. *A. loheri*

2. Leaves definitely 5-plinerved, rarely nearly or quite 5-nerved, always colored on the lower surface, cinereous to ferrugineous or cupreous, the lepidote scales minute, indistinct, mostly entirely covering the lower surface of the leaf, not scattered.
3. Leaves very definitely 5-plinerved, the inner pair of nerves leaving the midrib about 1 cm above the base of the leaf. 5. *A. williamsii*
3. Leaves less definitely 5-plinerved, the inner pair of nerves leaving the midrib nearer the base of the leaf.
4. Lower surface of the leaves very densely ferruginous-lepidote; leaves thickly coriaceous..... 6. *A. ferruginea*
4. Lower surface of the leaves densely papery-lepidote with very thin, pale-brown scales; leaves chartaceous..... 7. *A. meyeri*
4. Lower surface of the leaves very densely cupreous-lepidote; leaf-blades distinctly decurrent along the petioles..... 8. *A. dioica*
4. Lower surface of the leaves cinereous or pale brownish-cinereous, the minute scales very indistinct.
5. Leaves 10 to 15 cm long..... 9. *A. ramosii*
5. Leaves 20 to 30 cm long..... 10. *A. candolleana*

1. Leaves definitely 3-nerved or 3-plinerved, the additional pair, if present, always very slender and marginal, never prominent.
2. Leaves entirely glabrous, green or nearly so on the lower surface, sometimes glaucous, or the younger ones minutely cinereous-lepidote, glabrescent; nerves sometimes more or less furfuraceous, usually glabrous.
3. Leaves 3-nerved.
4. Calyx 3 to 4 mm in diameter, the teeth very prominent; leaves entirely glabrous ..... 11. *A. viridifolia*
4. Calyx about 2 mm in diameter, the teeth small; leaves at least somewhat furfuraceous on the nerves on the lower surface. 12. *A. rolfei*

3. Leaves 3-plinerved.
4. Lateral nerves extending to the very apex of the leaf.
5. Leaves 1.5 to 3.5 cm wide, slenderly caudate-acuminate. 13. *A. acuminatissima*
5. Leaves 4 to 8 cm wide..... 12. *A. rolfei*
4. Lateral nerves confluent with the midrib at the base of the prominent acumen ..... 14. *A. wenzelii*

2. Leaves with distinct, scattered, brown, lepidote scales which do not cover the entire lower surface, usually about one scale to each ultimate reticulation.
3. Leaves definitely 3-nerved.
4. Petals 4 to 5 mm long; calyx 6 to 8 mm in diameter. 15. *A. megalantha*
4. Petals 3 mm long; calyx about 5 mm in diameter. 16. *A. negrosensis*

3. Leaves definitely 3-plinerved.
   4. Leaves pale on the lower surface, their margins not revolute, the acumen sharp; inflorescence subglabrous..... 17. *A. subcaudata*
   4. Leaves green on the lower surface, their margins revolute, the acumen more or less blunt; inflorescence densely dark ferruginous-lepidote ..... 18. *A. gitingensis*
2. Leaves more or less densely covered on the lower surface with minute, ferruginous to cinereous-ferruginous or pale lepidote indumentum which quite or nearly covers the lower surface of the leaf, often more or less evanescent in fully mature leaves.
   3. Leaves very densely ferruginous-lepidote, the individual scales more or less distinct under a lens..... 19. *A. pulchra*
   3. Leaves minutely pale- or cinereous-ferruginous-lepidote, the scales indistinct under a lens.
      4. Calyx 1.5 to 2.5 mm in diameter.
         5. Calyx glabrous or nearly so, the leaves pale-gray to nearly white beneath ..... 20. *A. bicolor*
         5. Calyx densely cinereous- or ferrugineous-lepidote; leaves more or less pale-brownish beneath.
            6. Leaves 10 cm long or less, apex slenderly caudate-acuminate, adult ones glabrescent..... 21. *A. parvifolia*
            6. Leaves exceeding 10 cm in length.
               7. Leaves pale-gray or whitish beneath; rachis and branches of the inflorescence glabrous or subglabrous. 22. *A. discolor*
               7. Leaves pale-brownish-cinereous, the inflorescence densely lepidote or more or less furfuraceous.
                  8. Lower surface of the leaves with pale-brownish indumentum of the same color on all parts. 23. *A. cumingiana*
                  8. Lower surface of the leaves pale-lepidote in strong contrast to the dark brown lepidote nerves and nervules. 24. *A. piperi*
      4. Calyx 3 to 4 mm in diameter.
         5. Leaves 3-nerved or obscurely 3-plinerved, more or less glaucous beneath.
            6. Indumentum of the inflorescence pale; leaves 3-nerved, up to 16 cm in length..... 7. *A. meyeri*
            6. Indumentum of the inflorescence dark reddish-brown; leaves obscurely 3-plinerved, 8 to 10 cm long..... 25. *A. glauca*
         5. Leaves very prominently 3-plinerved, 20 to 30 cm long. 26. *A. platyphylla*

1. **ASTRONIA APOENSIS** Elm. Leafl. Philip. Bot. 4 (1911) 1206.

MINDANAO, District of Davao, Mount Apo, *Elmer 11427* (type number).

This very characteristic endemic species is readily recognizable by its unusually large, many-nerved leaves.

2. **ASTRONIA MEARNSII** sp. nov.

Arbor circiter 10 m alta ut videtur polygamo-dioica; foliis coriaceis, ellipticis ad oblongo-ellipticis, circiter 20 cm longis, in siccitate utrinque pallide viridibus, subtus distinct lepidotis, basi

rotundatis, prominente 5-nerviis; paniculis brevibus, floribus ♂ 5-meris, calycibus in alabastro cupulatis, 5-dentatis, circiter 3 mm diametro.

A tree about 10 m high, with rather stout branches. Leaves elliptic to oblong-elliptic, coriaceous, about 20 cm long, 8 to 10 cm wide, when dry pale-green or yellowish-green on both surfaces, the upper surface glabrous, the lower with numerous, small, scattered, brown, lepidote scales, the base rather broadly rounded, the apex apparently acuminate; nerves 5, prominent, all basal, the transverse nervules almost as prominent as the primary nerves on the lower surface; petioles about 4 cm long, the upper side channeled, the margins more or less scurfy-appendiculate. Panicles small, terminal, sparingly lepidote or nearly glabrous. Flowers few, only staminate ones observed, the calyx cup-shaped, minutely and sparingly lepidote, about 3 mm in diameter, shortly 5-toothed.

MINDANAO, Province of Misamis, Mount Malindang, *For. Bur. 4689 Mearns & Hutchinson*, May, 1906, in forests, altitude about 1800 m.

A species well characterized by its pale-green, prominently 5-nerved, elliptic leaves which are rounded at the base. It is manifestly very closely allied to *Astronia lagunensis* Merr., differing especially in its differently shaped leaves.

3. **ASTRONIA LAGUNENSIS** Merr. in Philip. Journ. Sci. 1 (1906) Suppl. 213.

LUZON, Province of Laguna, Mount Maquiling, *Loher 6267, 7310, Baker 253, Camus s. n., Merrill 5144, Bur. Sci. 9744 Robinson, For. Bur. 7763 Curran & Merritt, Phil. Pl. 1013 Ramos.*

A very characteristic species known only from Mount Maquiling, Province of Laguna, Luzon, where it is abundant in forests from 700 to 1050 meters altitude. The polygamo-dioecious character of this species is strongly marked, the male flowers being characterized by their cup-shaped calyces, while the perfect ones, which are borne in separate panicles and presumably on separate trees, are characterized by their urceolate calyces.

4. **ASTRONIA LOHERI** sp. nov.

Ut videtur arbor parva; ramis subteretibus, crassis; foliis anguste ellipticis, coriaceis, circiter 15 cm longis, in siccitate utrinque pallide viridibus, subtus parce lepidotis, basi acutis, prominente 5-nerviis; paniculis terminalibus, pyramidatis, dense brunneo-setosis, calycibus in alabastro 5 ad 7 mm diametro, ferrugineo-lepidotis, prominente urceolatis, 5-dentatis.

Apparently a small tree, the branches terete, thick. Leaves narrowly elliptic, coriaceous, about 15 cm long, 6 to 7 cm wide, narrowed below to the acute base and above to the somewhat acuminate apex, when dry uniformly pale-green on both surfaces, the upper one glabrous, the lower with distinct, scattered, brown,

small, lepidote scales; nerves 5, from the very base of the leaf, very prominent, the transverse nervules also prominent; petioles about 5 cm long, their margins more or less densely papillose-setose. Panicles terminal, pyramidal, about 7 cm long and 10 cm wide, the rachis and few branches stout, densely covered with rather soft, pale-brown, setose appendages. Flowers perfect, crowded at the ends of the branches, subtended by rather large, ovate, more or less lepidote, 1 cm long, deciduous bracteoles. Calyx, in mature bud, prominently urceolate, 5 to 7 mm in diameter, somewhat brown-lepidote, with 5 large, triangular-ovate, acute teeth.

LUZON, Province of Rizal, Angilog, *Loher 6294*, March 1906.

A species greatly resembling *Astronia lagunensis* Merr., and very closely allied to that form, differing in its furfuraceous-lepidote bracts and calyces, and its prominently setose panicles and petioles. Like *Astronia lagunensis* it is apparently polygamo-dioecious, but the single specimen available presents only perfect flowers.

5. **ASTRONIA WILLIAMSII** Merr. ex C. B. Rob. in Philip. Journ. Sci. 6 (1911) Bot. 214.

LUZON, Province of Rizal, *Loher 6286*, *Phil. Pl. 451 Merrill:* Province of Bataan, *Williams 722, 663, 621:* Province of Laguna, Mount Maquiling, *Bur. Sci. 16915 Serviñas, Tirona s. n., Baker 376, For. Bur. 13170 Curran, Gates 5417, 6135, Palafox s. n.;* San Antonio, *Bur. Sci. 10927, 15025, 15099, 16538, 16546, 16590 Ramos;* Mount Banajao, *Gates 6084:* Province of Tayabas, Mount Pular, *Bur. Sci. 19424 Ramos.* POLILLO, *Bur. Sci. 9114 Robinson.* MINDANAO, District of Zamboanga, *Merrill 8102.*

This species is also polygamous-dioecious, and presents cup-shaped calyces for the staminate flowers, and urceolate ones for the perfect flowers, the two kinds always being in separate inflorescences, and apparently on separate plants.

6. **ASTRONIA FERRUGINEA** Elm. Leafl. Philip. Bot. 4 (1911) 1205.

LUZON, Province of Rizal, *Loher 6281.* MINDANAO, District of Davao, Mount Apo, *Elmer 11426* (type number).

Var. AMPLA var. nov.

A typo differt foliis majoribus, 15 ad 25 cm longis.

BASILAN, Comalarang River, *Bur. Sci. 16133 Reillo, For. Bur. 18900 Miranda,* September, 1912, in forests.

The species is very well characterized by its exceedingly dense, dark-ferruginous indumentum. The leaves are 5-plinerved rather than 5-nerved.

7. **ASTRONIA MEYERI** Merr. in Govt. Lab. Publ. (Philip.) 35 (1906) 51; Philip. Journ. Sci. 1 (1906) Suppl. 106.

LUZON, Province of Bataan, Mount Mariveles, *For. Bur. 2840 Meyer:* Province of Laguna, Mount Maquiling, *Quisimbing s. n.;* Mount Banajao, *Bur. Sci. 19541 Ramos.* MINDORO, Mount Halcon, *For. Bur. 4347 Merritt.*

Apparently rare; well characterized by its thin, papery-lepidote, pale-brown indumentum.

8. **ASTRONIA DIOICA sp. nov.**

Species distinctissima, dioica vel polygamo-dioica; foliis ovato-ellipticis vel oblongo-ellipticis, usque ad 30 cm longis, nitidis, supra glabris, subtus densissime cupreo-lepidotis, apice breviter acuminatis, basi decurrentibus, 5- vel 7-plinerviis; inflorescentiis brevibus, confertis, bracteolis lineari-lanceolatis; floribus ♂ 5-meris.

A tree about 10 m high, dioecious or polygamo-dioecious, the branches terete, brown, glabrous, the growing parts, petioles, lower surfaces of the leaves and the inflorescence very densely cupreous-lepidote. Leaves opposite, chartaceous to subcoriaceous, ovate-elliptic to oblong-elliptic, 17 to 30 cm long, 3 to 13 cm wide, the upper surface glabrous, greenish when dry, shining, the lower cupreous, shining, the apex rather abruptly short-acuminate, the base narrowed and more or less decurrent along the petiole; nerves sub-basal, 5 or 7, the marginal ones faint, the inner two pairs reaching the apex, the innermost pair leaving the midrib at from 1 to 3 cm above the base, more prominent than the others, the transverse nervules distant, slender, distinct on the lower surface; petioles 1.5 to 3 cm long, more or less winged by the decurrent lamina. Inflorescence terminal, peduncled, the whole 4 to 5 cm long, often trichotomous, all parts cupreous-lepidote, the flowers numerous, densely crowded; bracts lanceolate, narrowed at both ends, acuminate, about 12 mm long, 4 to 5 mm wide, the bracteoles linear-lanceolate, more or less curved, 6 to 7 mm long, 1 to 1.3 mm wide. Flowers 5-merous, only the staminate ones seen. Calyx cupreous, shallowly cup-shaped, 3 to 3.5 mm in diameter, 2 mm long, the teeth 5, rarely 6, triangular, acute or somewhat acuminate, about 1 mm long, 1.5 mm wide at the base. Petals 5, imbricate, suborbicular to orbicular-ovate, about 2.5 mm long. Stamens 10, the filaments broad, flat, about 1 mm long. Ovary entirely wanting.

LEYTE, Mount Ibuni, near Dagami, *Bur. Sci. 15293 Ramos*, August, 1912, in damp forests.

A most characteristic species, distinguishable by its leaves being green above and densely cupreous-lepidote beneath, its dense, cupreous-lepidote inflorescences, and its long bracts and bracteoles.

9. **ASTRONIA RAMOSII sp. nov.**

Arbor parva, circiter 8 m alta, *A. cumingianae* Vid. affinis, differt foliis paullo majoribus, basi 5-plinerviis, nervis interioribus transversalibusque valde prominentibus.

A small tree about 8 m high, the branches terete, grayish, glabrous, the branchlets and inflorescence more or less furfura-

ceous. Leaves opposite, subelliptic, equally narrowed at both ends, 14 to 19 cm long, 7 to 8 cm wide, the apex very shortly acuminate, the base acute, subcoriaceous, the upper surface smooth and shining, the lower pale or slightly brownish, uniformly and densely covered with minute, appressed, lepidote scales which are scarcely evident under a lens, the base 5-plinerved, the external pair of nerves slender, within 2 mm of the margin, leaving the very base of the leaf, the inner pair very prominent, leaving the midrib about 5 mm above the base and extending to the apex, the transverse nervules subparallel very prominent; petioles 3 to 3.5 cm long, often somewhat furfuraceous. Panicles terminal, shortly peduncled, up to 15 cm long and about as wide in anthesis, subpyramidal, all parts rather densely furfuraceous with minute, pale-ferruginous scales. Flowers very numerous, 5-merous, their pedicels about 2 mm long, only perfect ones seen. Calyx broadly urceolate, furfuraceous-lepidote, about 3 mm in diameter, 2.5 to 3 mm long, the subglobose tube distinctly constricted near the apex, the limb with 5, distinct, very broad, acute teeth less than 1 mm in length. Petals broadly obovate, rounded, about 2 mm long, concave. Stamens 10, 2 mm long. Ovary 2-celled; style 2.8 mm long; stigma disk-like, 1 mm in diameter. Fruit depressed-globose, about 4 mm in diameter, very obscurely lepidote or nearly glabrous, crowned by the short calyx-rim. Seeds very numerous, linear, about 2 mm long.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 10872* (type), *16524 Ramos*, August, 1910, and September, 1912, in forests along streams.

A species similar to and manifestly closely allied to *Astronia cumingiana* Vid., but with more prominent nerves, somewhat larger leaves, and denser indumentum. *Astronia rolfei* Vid., as here interpreted, is still another allied form, which, however, has ultimately nearly or quite glabrous leaves, green on both surfaces.

10. **ASTRONIA CANDOLLEANA** Cogn. in DC. Monog. Phan. 7 (1891) 1099; Merr. in Philip. Journ. Sci. 1 (1906) Suppl. 108.

Astronia papeteria F.-Vill. Novis. App. (1880) 89; Vid. Phan. Cuming. Philip. (1885) 114, non Blume.

LUZON, Province of Cagayan, *For. Bur. 11315 Klemme:* Subprovince of Bontoc, *For. Bur. 18395 Alvarez:* Province of Bataan, *For. Bur. 750 Borden:* Province of Rizal, *Phil. Pl. 1042 Ramos, Bur. Sci. 981, 2645 Ramos, Merrill 2357, For Bur. 2097 Ahern's collector:* Province of Laguna, *Bur. Sci. 16626 Ramos:* Province of Albay, *Cuming 850* (Herb. Kew.).

11. **ASTRONIA VIRIDIFOLIA** Elm. Leafl. Philip. Bot. 4 (1911) 1203.

LUZON, Province of Laguna, *Bur. Sci. 10032, 10963, 15118, 16642 Ramos*, indicated as a new species and the duplicates distributed under another

specific name: Province of Cagayan, *For. Bur. 17203 Curran.* SIBUYAN, *Elmer 12281* (type collection).

Well characterized by its entirely glabrous leaves. It differs from *Astronia rolfei* Vid., in the entire absence of indumentum, even on young leaves, its larger flowers, and its longer calyx-teeth.

12. **ASTRONIA ROLFEI** Vid. Phan. Cuming. Philip. (1885) 114, 174, Rev. Pl. Vasc. Philip. (1886) 136; Cogn. in DC. Monog. Phan.. 7 (1891) 1095; Merr. in Philip. Journ. Sci. 1 (1906) Suppl. 108.
Astronia lucbanensis Elm. Leafl. Philip. Bot. 4 (1911) 1201.

LUZON, Province of Nueva Vizcaya, *For. Bur. 14851 Darling:* Province of Rizal, *Loher 6277:* Province of Bataan, *Leiberg 6056, Whitford 238:* Province of Laguna, San Antonio, *Bur. Sci. 15026, 20516, Ramos:* Province of Tayabas, Mount Banajao, *Elmer 7807* (type number of *A. lucbanensis*), *7448:* Province of Batangas, *For. Bur. 21504, 21557 Tamesis.* MINDANAO, Province of Surigao, *Ahern 344, Sanchez, Quadras.*

Var. **FURFURACEA** var. nov.

A typo differt paniculis prominente longe furfuraceis vel furfuraceo-setosis, paleis usque ad 2.5 mm longis.

LUZON, Province of Cagayan, Misiones River, *For. Bur. 17180 Curran.*

This variety differs from *Astronia rolfei,* as here interpreted, chiefly in its very densely paleaceous or furfuraceous-setose inflorescence, the scales being much longer than those in the typical form of the species.

Astronia rolfei Vid., has been interpreted chiefly from the original description, but the specimens referred to it do not agree with the description in all particulars. The type is *Cuming 1723,* from Samar, and Vidal referred to the same species his No. *1392* from Albay Province, Luzon. In 1907 I examined the original material in the Kew Herbarium, and referred to the species *Whitford 238,* but a more critical comparison seems to be necessary. Some of the specimens here considered to represent *Astronia rolfei* have 3-plinerved, rather than 3-nerved leaves, and in all the specimens the adult leaves are nearly or quite glabrous; the character "subtus pallide ochraceo-lepidota evanescentia" does not well apply to our material, except to the form described as *Astronia lucbanensis* Elm. This character, however, does apply sufficiently well to some of the specimens I have referred to *Astronia cumingiana* Vid., which have 3-nerved leaves, and under that species I have placed specimens having both 3-nerved and 3-plinerved leaves. I have suspected that *Astronia cumingiana* and *Astronia rolfei* are really but forms of the same species, but a critical examination of the type material is necessary to determine the matter. The species, as here interpreted, presents cup-shaped male flowers and urceolate perfect ones on separate plants, so that the species is apparently polygamo-dioecious. I am unable to discover any constant characters by which *Astronia lucbanensis* Elm. can be distinguished from *A. rolfei* Vid., as I understand the latter species.

13. **ASTRONIA ACUMINATISSIMA** sp. nov.

Species praecedente affinis, differt foliis minoribus, usque ad 10 cm longis, 4 cm latis, longe caudato-acuminatis, manifeste triplinerviis, paniculis multo minoribus, circiter 5 cm longis.

A small, polygamo-dioecious tree 6 to 10 m high, nearly glabrous; branches slender, terete, light-gray, glabrous, the younger branchlets, petioles and inflorescence minutely lepidote with small, appressed, pale-brownish, more or less decidious scales. Leaves oblong-elliptic to broadly oblong-lanceolate, firmly chartaceous, brittle when dry, 6 to 10 cm long, 1.5 to 4 cm wide, of about the same color, brownish-green, on both surfaces when dry, shining, entirely glabrous, or the very young ones minutely and deciduously lepidote, not pale, about equally narrowed to the long and slender caudate-acuminate apex, the acumen blunt, 1 to 2 cm long and often slightly falcate, and to the distinctly acuminate base which is prominently 3-plinerved, the lateral nerves leaving the midrib at from 4 to 8 mm above the base, the transverse nervules slender, prominent, nearly straight; petioles 1.3 to 2 cm long. Panicles terminal, pyramidal, about 5 cm long, the branches few, spreading, the lower ones 3 cm long or less, minutely pale brownish-lepidote, subglabrescent in fruit. Flowers small, 5-merous, staminate ones on some trees, perfect ones on others. Staminate flowers: Calyx cup-shaped, minutely lepidote, about 1.5 mm in diameter, minutely 5-toothed. Perfect flowers: Calyx lepidote, urceolate, about 2 mm in diameter, 1.5 mm long, minutely 5-toothed, limb slightly spreading above the constriction. Petals somewhat obovate, 1.5 mm long. Ovary 2-celled; style stout, 2 mm long. Capsules depressed-globose about 2.5 mm in diameter, nearly glabrous; seeds very numerous, 1.2 mm long.

LUZON, Province of Rizal, San Isidro, *Phil. Pl. 257 Ramos*, June, 1910 (type), distributed as *Astronia rolfei* Vid.; Montalban, *Loher 6276*, February, 1906: Province of Laguna, Mount Banajao, *For. Bur. 7903 Curran & Merrit*, November, 1907.

Well characterized by its entirely glabrous, concolorous, green, small, caudate-acuminate, prominently 3-plinerved leaves and its small panicles.

14. ASTRONIA WENZELII sp. nov.

Species *A. viridifoliae* Elm. simillima et valde affinis, differt foliis prominente 3-plinerviis vix 3-plinerviis, nervis lateralibus ad basin acuminis cum costa coalita.

A small tree about 7 m high, the trunk 8 cm in diameter, glabrous except the very young growing parts and the slightly lepidote inflorescence. Leaves broadly elliptic-lanceolate to broadly oblong-lanceolate, firmly chartaceous to subcoriaceous, green, of the same color and slightly shining on both surfaces when dry, 13 to 20 cm long, 4 to 5.5 cm wide, about equally narrowed to the cuneate base and to the slenderly acuminate apex,

the acumen blunt or subacute, 1 to 1.5 cm long; nerves a single pair, prominent, leaving the midrib 5 to 10 mm above the base, extending nearly to the apex, there confluent with the midrib at the base of the acumen, lateral nervules about 20 pairs between the midrib and the longitudinal nerves, rather slender; petioles 1.5 to 2.5 cm long. Panicles terminal, slightly lepidote with pale yellowish-brown, minute scales, subcorymbose, about 4 cm long and 8 cm wide, the branches few, the flowers red, 5-merous, somewhat crowded at the ends of the branchlets, ebracteolate. Calyx sparingly lepidote, urceolate, about 3 mm in diameter, and about as long, the limb somewhat spreading above the constriction, the teeth 5, very broadly triangular-ovate, about 1 mm long, acute. Petals very broadly obovate, 2 mm long. Stamens 10. Ovary 2-celled; style stout, about 3.5 mm long.

LEYTE, Dagami, *C. A. Wenzel 204*, June 19, 1913, in forests.

A species very closely allied to *Astronia viridifolia* Elm., which apparently always has definitely 3-nerved leaves; the present species, although resembling Elmer's species in most other particulars, has very definitely 3-plinerved leaves, presenting no intermediate forms.

15. ASTRONIA MEGALANTHA sp. nov.

Arbor parva circiter 6 m alta; foliis lanceolatis vel oblongo-lanceolatis, coriaceis, nitidis, usque ad 14 cm longis, utrinque angustatis, basi acutis, 3-nerviis, apice subcaudato-acuminatis, supra glabris, subtus parce brunneo-lepidotis; inflorescentiis terminalibus, paniculatis, breviter pedunculatis, dense brunneo-furfuraceo-lepidotis; floribus 5-meris, calycibus circiter 7 mm diametro, lobis triangularibus acutis, 2 mm longis; ovario 2-loculare.

A small tree about 6 m high, the very youngest branches and the lower surfaces of the leaves with scattered, dark-brown, lepidote scales, the inflorescence densely furfuraceous-lepidote, the indumentum dark-brown, otherwise glabrous. Branches terete, light-gray, wrinkled when dry, the nodes rather prominent, 1 cm apart on the younger branches. Leaves opposite, lanceolate or oblong-lanceolate, subcoriaceous, narrowed at both ends, the base acute, 3-nerved, the apex subcaudate-acumunate, 10 to 14 cm long, 2 to 4 cm wide, the margin slightly recurved when dry, the upper surface glabrous, shining, greenish when dry, the lower brownish, somewhat paler then the upper, with scattered, brown, lepidote scales, the basal nerves prominent, leaving the midrib at the very base of the lamina, reaching the apex, sometimes a very faint additional pair present less than 1 mm distant from the margin; transverse veinlets slender, not

prominent, distant; petioles 1.5 to 2 cm long. Panicles terminal, densely covered with a dark-brown, furfuraceous-lepidote indumentum, peduncled, many-flowered, the whole 6 to 8 cm long and 5 to 7 cm wide, the lower branches up to 4 cm in length. Flowers comparatively large for the genus, 5-merous. Calyx broadly urceolate-cup-shaped, in anthesis 8 mm long and 7 mm wide, densely brown-lepidote, the lobes triangular, acute, 2 mm long, 3 mm wide at the base. Petals suborbicular, about 3 mm in diameter. Filaments 2 mm long, a little more than 1 mm wide; anthers 1.7 mm long. Ovary 2-celled; style 4 mm long, cylindric, the disk-like stigma about 1.8 mm in diameter.

LEYTE, Mount Buraui, near Dagami, *Bur. Sci. 15258 Ramos*, August 13, 1912, near the summit, in forests, the flowers yellowish with purple petals.

A species readily distinguishable by its comparatively large flowers, the calyx densely brown-lepidote, and its 3-nerved, slenderly acuminate leaves which are brownish beneath and with scattered, brown, lepidote scales.

16. ASTRONIA NEGROSENSIS sp. nov.

Arbor 5 ad 8 m alta; foliis oblongis vel oblongo-ellipticis, chartaceis vel subcoriaceis, usque ad 20 cm longis, praeter nervis tenuissimis submarginalibus 3-nerviis, junioribus subtus parce brunneo-lepidotis, vetustioribus glabrescentibus, utrinque aequaliter angustatis, basi acutis, apice brevissime acuminatis; paniculis terminalibus, corymbosis, quam folia multo brevioribus, 5 ad 12 cm latis, dense brunneo-furfuraceo-lepidotis; floribus 5-meris, 6 mm longis.

A tree 5 to 8 m high. Branches terete, glabrous, the growing parts brown-furfuraceous-lepidote. Leaves oblong to oblong-elliptic, chartaceous or subcoriaceous, 15 to 20 cm long, 4 to 8 cm wide, equally narrowed at both ends, base acute, apex very shortly acuminate, the upper surface glabrous, somewhat shining, the lower surface in young leaves with scattered, brownish scales, in age becoming quite glabrous and of about the same color as the upper surface, somewhat shining; nerves 3 from the base, prominent, reaching the apex, with usually a very slender additional pair of submarginal nerves not more distinct then the transverse veinlets; petioles 3 to 5 cm long, at first somewhat lepidote, becoming glabrous. Panicles terminal, corymbose, uniformly furfuraceous-lepidote with small, dark-brown scales, 5 to 7 cm long, 5 to 12 cm wide. Flowers red and yellow, about 6 mm long, their pedicels 2 mm long. Calyx brown-furfuraceous-lepidote, somewhat urceolate, about 5 mm long, the teeth 5,

broadly triangular-ovate, acute, 1.5 mm long. Petals orbicular-obovate, 3.5 mm long. Filaments flattened, 2 mm long.

NEGROS, Iruiogaan River, *For. Bur. 4298 Everett*, June, 1906 (type), altitude about 150 m; Cadiz, *For. Bur. 15034 Danao*, March, 1908; Gimagaan River, *For. Bur. 7303 Everett*, May, 1907, *Whitford 1567*, May, 1906.

A species well characterized by its 3-nerved, not 3-plinerved leaves and comparatively large flowers. It is very close to the preceding, but otherwise is probably as closely allied to *Astronia candolleana* Cogn., as to any other species, although entirely different in venation and indumentum.

17. **ASTRONIA SUBCAUDATA** sp. nov.

Frutex circiter 2 m altus; foliis chartaceis, in siccitate pallidis, subtus lepidis brunneis parvis conspersis instructis, oblongo-obovatis, 6 ad 10 cm longis, apice longe acuteque subcaudato-acuminatis, basi angustatis, acutis vel decurrento-acuminatis, 3-plinerviis; paniculis quam folia brevioribus, subglabris vel leviter brunneo-furfuraceis; capsulis depresso-globosis vel ovoideis, circiter 3 cm diametro.

A shrub about 2 m high. Branches terete, light-gray, glabrous, the growing parts somewhat brownish-lepidote. Leaves chartaceous, oblong-obovate, rather pale when dry, apex long-acuminate, the acumen sharp, subcaudate, the base gradually narrowed, acute or decurrent-acuminate, 6 to 10 cm long, 2 to 4 cm wide, somewhat shining, the upper surface glabrous, the lower pale, with small, scattered, brown, lepidote scales which by no means cover the entire surface; nerves 3, the lateral pair leaving the midrib just above the base, reaching the apex, the transverse nervules slender, distinct, numerous; petioles slender, lepidote, 1 to 1.5 cm long. Flowers unknown. Fruiting panicles shorter than the leaves, about 3 cm long, wider than long, nearly glabrous or somewhat brown-furfuraceous. Capsules depressed-globose or ovoid, about 3 mm in diameter.

LUZON, Province of Tayabas, Infanta, Mount Binuang, *Bur. Sci. 9457 Robinson* (type), August 29, 1909, in forests, altitude about 800 m: Province of Laguna, Kelugan River, *For. Bur. 19268, Curran* February, 1910.

Well characterized by its rather small, sharply subcaudate-acuminate leaves which are narrowed and acute or decurrent-acuminate at the base, and sparingly lepidote beneath with scattered, brown, small scales, about one scale to each ultimate reticulation.

18. **ASTRONIA GITINGENSIS** Elm. Leafl. Philip. Bot. 4 (1911) 1202.

SIBUYAN, Mount Giting-giting, *Elmer 12518* (type collection).

The striking character of this species is its dark reddish-brown indumentum on its branchlets, inflorescences, and nerves on the lower surfaces of the younger leaves; the adult leaves are glabrous or nearly so.

19. **ASTRONIA PULCHRA** Vid. Rev. Pl. Vasc. Filip. (1885) 136; Cogn. in DC. Monog. Phan. 7 (1891) 1097.
Astronia cuernosensis Elm. Leafl. Philip. Bot. 4 (1911) 1204.

LUZON, Subprovince of Ifugao, Mount Polis, *Bur. Sci. 19668 McGregor*, February, 1913: Province of Rizal, Angilog, *Loher 6293*, March, 1906: Province of Bataan, Mount Mariveles, *Elmer 6827*, *For. Bur. 2757 Meyer* (both with larger leaves than the type, 8 to 12 cm long): Province of Laguna, Mount Maquiling, *For. Bur. 7764 Curran & Merritt:* Province of Albay, *For. Bur. 14283 Aguilar:* Province of Sorsogon, *For. Bur. 10549 Curran.* LEYTE, Dagami, *Bur. Sci. 15361 Ramos.* NEGROS, Cuernos Mountains, *Elmer 10356, 10234* (type number of *A. cuernosensis* Elm.); Mount Silay, *Whitford 1523.* MINDANAO, District of Davao, Mount Apo, *Elmer 11630.*

Var. **OBOVATA** var. nov.

A typo differt foliis obovatis, fructibus majoribus, circiter 4 mm diametro.

LUZON, Province of Zambales, Mount Tapulao, *Bur. Sci. 5013 Ramos*, November, 1907.

In vegetative characters, other than the shape of its leaves, and in its indumentum this form is quite the same as typical *Astronia pulchra* Vid. The fruits are decidedly larger.

Astronia pulchra Vid. was based on *Vidal 245* from Mount Iriga, Province of Camarines, Luzon, and it has been interpreted here from the description only. A memorandum received from Kew in 1910, regarding the type, states that the type specimen could not then be found, nor could Dr. C. B. Robinson find it there a year later. The material here referred to *A. pulchra* agrees in all particulars with the description, and presents comparatively little variation in essential characters; the dense, brownish indumentum which is composed of small appressed scales distinctly visible under a lens is characteristic.

In describing *Astronia cuernosensis* as a new species, Mr. Elmer states "Quite different from the description of *A. pulchra* Vid." A careful examination of the type material, and a comparison with Vidal's description does not indicate to me any characters by which *A. cuernosensis* Elm. can be distinguished from *A. pulchra* Vid; in *Astronia cuernosensis* the leaves are apparently 3-plinerved instead of 3-nerved, but this difference is more apparent than real, for the lateral nerves follow the midrib closely to the very base of the leaf, leaving the midrib at 3 mm or less above the base. The same character is found on some of the other specimens cited here.

20. **ASTRONIA BICOLOR** sp. nov.

Arbor circiter 10 m alta; partibus junioribus foliis inflorescentiisque plus minusve lepidotis; foliis oblongo-ellipticis, usque ad 13 cm longis, coriaceis, acuminatis, basi decurrento-acuminatis, 3-nerviis vel obscure 3-plinerviis, subtus pallide griseis, densissime et minute lepidotis; paniculis parvis; floribus 5-meris, circiter 2 mm diametro, calycibus extus parcissime lepidotis vel subglabris.

A small tree, about 10 m high. Branches light-gray or somewhat brownish, terete or nearly so, glabrous, the branchlets minutely appressed-lepidote, the scales deciduous. Leaves opposite, oblong-elliptic, coriaceous, 7 to 13 cm long, 2 to 4.5 cm wide, about equally narrowed to the acuminate apex and to the somewhat decurrent-acuminate base, the upper surface glabrous, shining, brownish-olivaceous, the lower pale-gray, very densely and minutely lepidote with appressed scales, the base 3-nerved, or the nerves following the midrib a short distance above the base and hence appearing obscurely 3-plinerved, the transverse nervules straight, prominent; petioles 1 to 2 cm long. Panicles terminal, pyramidal, 5 cm long or less, sparingly lepidote, the branches few, the lower ones about 3 cm long. Flowers small, 5-merous, somewhat crowded toward the ends of the branchlets. Calyx cup-shaped, obscurely 5-toothed, about 2 mm in diameter. Capsules depressed-globose, glabrous or nearly so, about 3 mm in diameter.

LUZON, Subprovince of Benguet, Mount Ugo, *For. Bur. 10851 Curran* (type), *For. Bur. 18004 Merritt*, December 16, 1908, in small valleys forested with broad-leaved trees in the pine region, altitude about 2,000 meters.

Manifestly allied to *Astronia pulchra* Vid., from which it is distinguished by its pale-gray, not ferruginous indumentum, and its nearly glabrous calyces.

21. ASTRONIA PARVIFOLIA sp. nov.

Arbor parva, polygamo-dioica; foliis submembranaceis vel chartaceis, ovato-elipticis ad oblongo-lanceolatis, 6 ad 10 cm longis, junioribus subtus minutissime cinnamomeo-lepidotis glabrescentibus, longe acuminatis, basi acutis vel acuminatis, 3-nerviis vel obscure 3-plinerviis; paniculis terminalibus, pauciforis, circiter 2 cm longis.

A polygamo-dioecious tree 4 to 10 m high, the older parts quite glabrous, the branchlets, younger petioles and inflorescences sparingly pale ferruginous-lepidote or somewhat furfuraceous. Branches terete, light-gray. Leaves ovate-elliptic to oblong-lanceolate, submembranaceous or chartaceous, 6 to 10 cm long, 2 to 4 cm wide, narrowed above to the prominently and long-acuminate apex, the acumen blunt or acute, about 1.5 cm long, straight or somewhat falcate, the base acute or slightly decurrent-acuminate, 3-nerved or obscurely 3-plinerved, the lateral nerves leaving the very base of the leaf, or following the midrib closely for 2 to 3 mm before leaving it, the upper surface green, glabrous, somewhat shining, the lower in young leaves minutely cinnamomeous-lepidote, soon becoming quite or nearly glabrous

and eventually of about the same color as the upper surface; petioles slender, about 1 cm long. Panicles terminal, solitary, pyramidal, short, few-flowered, more or less lepidote with appressed or somewhat spreading, pale-brownish scales, the branches few, 1.5 cm long or less. Male flowers: Calyx somewhat lepidote, cup-shaped, about 2 mm in diameter, obscurely 5-toothed, the pedicels 1 mm long or less, subumbellately arranged at the ends of the panicle-branches. Petals suborbicular, 1.2 mm in diameter. Stamens 10, short. Ovary none. Perfect flowers: Pedicels arranged as in the male flowers. Calyx broadly urceolate-campanulate, about 2 mm in diameter, 2 mm long, the limb somewhat spreading, somewhat lepidote, obscurely and broadly 5-toothed. Petals orbicular, 1.2 mm in diameter. Stamens 10, short. Ovary 2-celled; style 2 mm long.

CAMIGUIN DE MINDANAO, old volcano, *Bur. Sci. 14682 Ramos*, March 24, 1912 (type). LEYTE, mountains back of Dagami, *Bur. Sci. 15290 Ramos*, August, 1912.

Well characterized by its comparatively small, long-acuminate leaves, which, when young, are minutely cinnamomeous-lepidote, ultimately becoming quite or nearly glabrous, and green on both surfaces, and its very short, few-flowered panicles. It is most closely allied to *Astronia acuminatissima* Merr., from which it differs in its indumentum and in its very short panicles.

22. ASTRONIA DISCOLOR sp. nov.

Arbor circiter 10 m alta, polygamo-dioica; foliis oblongo-ellipticis, subcoriaceis, usque ad 14 cm longis, valde acuminatis, basi acutis, distincte 3-plinerviis, supra glabris, viridibus, subtus pallide griseis, densissime et minutissime adpresse lepidotis; paniculis pyramidatis, 7 ad 9 cm longis, multifloris, rhachis ramulisque subglabris; calycibus cupulatis, extus dense lepidotis, circiter 2 mm in diametro, obscure 5-dentatis.

A small tree, about 10 m high, polygamo-dioecious. Branches terete, light-gray, quite glabrous, the younger branchlets also quite glabrous, not at all lepidote. Leaves oblong-elliptic, subcoriaceous, 10 to 14 cm long, 4 to 6 cm wide, about equally narrowed to the acuminate apex and to the acute base, the acumen prominent, usually blunt, straight or falcate, up to 1.5 cm long, the upper surface glabrous, green or olivaceous when dry, somewhat shining, the lower surface pale-gray, very densely covered with minute, indistinct, appressed, lepidote scales which are scarcely evident individually under a lens, the base prominently 3-plinerved, the lateral nerves prominent, leaving the midrib at from 5 to 10 mm above the base, the transverse nervules promi-

nent, rather distant, nearly straight or somewhat curved; petioles 1 to 1.5 cm long, glabrous or nearly so. Panicles terminal, pyramidal, branched from the base or peduncled, 7 to 9 cm long, many-flowered, the rachis and branches glabrous or nearly so, the branches few. Male flowers yellowish, somewhat crowded at the ends of the branchlets, 5-merous, their pedicels up to 2 mm long. Calyx cup-shaped, 2 mm in diameter, obscurely 5-toothed, outside rather densely pale-lepidote. Petals very broadly ovate to ovate-orbicular, about 1.3 mm long, rounded, base with a very short, broad claw. Stamens 10, short. Ovary entirely wanting.

LUZON, Province of Laguna, Mount Maquiling, *Loher 6270*, April, 1906 (type), *Bur. Sci. 17325 Robinson & Brown* (Batangas side), February 24, 1913, in forests, altitude about 870 meters above sea level.

Well characterized by its 3-plinerved leaves which are green above and pale-gray beneath, and by its nearly glabrous panicles. Its closest ally is *Astronia bicolor* Merr., which, however, has distinctly lepidote branchlets, petioles, and panicles, and nearly glabrous or only slightly lepidote calyces.

23. **ASTRONIA CUMINGIANA** Vid. Phan. Cuming. Philip. (1885) 114, 174; Cogn. in DC. Monog. Phan. 7 (1891) 1098.

LUZON, Province of Cagayan, *Bur. Sci. 13996 Ramos, For. Bur. 14812 Darling:* Subprovince of Abra, *Bur. Sci. 7101 Ramos:* Subprovince of Benguet, *Bur. Sci. 12705 Fénix, Williams 1556, Elmer 6055, 6011:* Province of Nueva Vizcaya, *Bur. Sci. 11374, 20168 McGregor:* Province of Zambales, *Loher 6290:* Province of Rizal, *Merrill 1651, Bur. Sci. 1750 Ramos, For. Bur. 2163 Ahern's collector:* Province of Laguna, *Loher 6252, Bur. Sci. 20565 Ramos, Malvar 345:* Province of Albay, *Ahern 841.* MINDORO, *For. Bur. 9765 Merritt.* MINDANAO, District of Lanao, *Mrs. Clemens 356, s. n.;* Province of Surigao, *Ahern 322, 517.* BASILAN, *Bur. Sci. 16181 Reillo, For. Bur. 18924 Miranda.*

This species, as here interpreted, is the most common and widely distributed one in the Philippines, extending from northern Luzon to Basilan; it has also been reported from northeastern Celebes by Koorders. The type is *Cuming 999* from the Province of Pangasinan, Luzon, of which there is a mere fragment in the herbarium of the Bureau of Science. In describing the species Vidal also referred here Nos. *343, 644,* and *1387* of his own collection, the first two from Rizal Province, the last from Lepanto Subprovince. Among the specimens referred here some are distinctly 3-nerved, agreeing with the type number, *Cuming 999,* while others are as distinctly 3-plinerved, agreeing with the specimens of Vidal's own collection cited by him; it should be noted that in the original description of the species that it is described as having 3-plinerved leaves. From an examination of our large series of specimens it is evident that the 3-nerved and 3-plinerved forms referred here represent but a single species in spite of the differences in the extreme cases as to the disposition of the nerves. The vegetative characters otherwise, the indumentum generally, the inflorescences, and the flowers are fairly uniform in all the specimens. In

some forms with nearly glabrous adult leaves it is difficult to decide whether they should be referred here, or to *Astronia rolfei* as I have interpreted it. I agree with Mr. Elmer that, from the descriptions alone, it is difficult to determine the real differences between *Astronia rolfei* and *A. cumingiana*.

24. ASTRONIA PIPERI sp. nov.

Arbor circiter 15 m alta, ramulis petiolis inflorescentiisque densissime ferrugineo-lepidotis; foliis oblongo-ellipticis, subcoriaceis, usque ad 18 cm longis, utrinque subaequaliter angustatis, basi acutis, 3-nerviis, apice breviter obtuse acuminatis, in siccitate supra glabris, viridis, subtus minute pallide lepidotis, nerviis nervulisque brunneo-lepidotis; floribus ♂ 5-meris, numerosis, calycibus 2.5 mm diametro, 5-dentatis, cupulatis.

A tree about 15 m high, the trunk about 15 cm in diameter, the younger branchlets, petioles, inflorescence, and the nerves and nervules on the lower surface of the leaves densely ferruginous-lepidote or dark brown-lepidote, the nerves and nervules in sharp contrast to the pale-lepidote lower surface of the leaves. Leaves oblong-elliptic, 9 to 18 cm long, 4 to 7 cm wide, firmly chartaceous or subcoriaceous, about equally narrowed to the acute or obscurely rounded base and to the shortly acuminate apex, when dry the upper surface green, glabrous, shining, the lower pale, densely lepidote, the indumentum persistent, in rather sharp contrast to the dark brown-lepidote midrib, primary nerves, and to a less degree the transverse nervules of which there are about 25 pairs between the midrib and the longitudinal nerves; nerves prominent, leaving the very base of the leaf and extending to the apex, a very faint additional, submarginal, somewhat arched pair also usually present; petioles 1.5 to 3 cm long. Panicles terminal, subcorymbose, very densely dark brown-lepidote, 5 to 8 cm long, about as wide, many-flowered, the flowers somewhat crowded at the ends of the branchlets. Male flowers 5-merous, their pedicels 1 to 1.5 cm long, densely lepidote as are the cup-shaped calyces which are 5-toothed, about 2.5 mm in diameter. Petals very broadly elliptic-ovate, 2 mm long. Stamens 10. Ovary entirely wanting.

LEYTE, Dagami, *C. M. Wenzel 222* (type), June 21, 1913, in forests, the flowers white, pink, and yellow. MINDANAO, Province of Surigao, Hinatuan, *C. V. Piper 495*, May, 1911. POLILLO, *Bur. Sci. 9270 Robinson*, August, 1909.

A species manifestly allied to *Astronia cumingiana* Vid., *A. rolfei* Vid., etc., but distinguishable in general by its dark brown-lepidote, not pale, indumentum on its branchlets, petioles, inflorescences, nerves and nervules on the lower surfaces of the leaves. The one striking character by which

it may be recognized is the dense pale indumentum on the lower surface of the leaves in contrast to the dark brown-lepidote midrib, nerves, and nervules. The leaves are always very definitely 3-nerved, not at all 3-plinerved as in most of the material I have referred to *Astronia cumingiana* Vid.

25. **ASTRONIA GLAUCA** Merr. in Govt. Lab. Publ. (Philip.) 29 (1905) 31.

LUZON, Subprovince of Benguet, Baguio, *Elmer 6294:* Province of Nueva Vizcaya, ***For. Bur. 14868 Darling.***

This species has been reduced by me[4] to *Astronia pulchra* Vid., to which, however, it is really not closely allied. It may be distinguished by the very scanty indumentum, on its leaves, which are more or less glaucous on the lower surface, the lepidote scales being minute and indistinct, and not at all ferruginous. The dark-brown calyces are characteristic. Mr. R. A. Rolfe has re-examined the material in the Kew Herbarium, and in a memorandum supplied on the subject states that while *Vidal 345*, the type of *Astronia pulchra* Vid., could not be found in the Kew Herbarium, that *Vidal 3516* had been identified with *A. pulchra*, and that it is a species quite distinct from *A. glauca* Merr.

26. **ASTRONIA PLATYPHYLLA** sp. nov.

Arbor circiter 12 m alta, ramulis subtus foliis paniculisque dense pallide brunneo-lepidotis; foliis oblongo-ellipticis, usque ad 25 cm longis, utrinque angustatis, apice acutis vel leviter acuminatis, basi acutis, distincte 3- vel 5-plinerviis, nervis exterioribus tenuibus; paniculis solitariis, pedunculatis, circiter 18 cm longis, pyramidatis, multifloris; floribus ♂ confertis, 5-meris, calycibus cupulatis, circiter 4 mm diametro, obscure 5-dentatis.

A tree about 12 m high. Branches nearly terete, stout, glabrous, the ultimate branchlets very obscurely 4-angled, densely pale brown-lepidote, 5 to 7 mm in diameter. Leaves oblong-elliptic, coriaceous, 20 to 25 cm long, 8 to 11 cm wide, about equally narrowed to the acute or obscurely acuminate apex and to the acute base, the upper surface greenish-olivaceous, glabrous, shining, the lower very densely lepidote with pale-brownish, small, appressed scales; nerves 5, the interior pair very prominent, leaving the midrib 5 to 7 mm above the base, extending to the apex, the outer pair slender, at most 5 mm from the margin, very slightly arched between the ends of the lateral nervules, leaving the very base of the leaf and there very close to the margin, the transverse nervules between the midrib and the interior nerves about 25, nearly straight, prominent; petioles 4 to 5 cm long, densely pale brownish-lepidote with small scales. Panicles terminal, solitary, the peduncles about 4 cm long, the whole

[4] Philip. Journ. Sci. 3 (1908) Bot. 117.

inflorescence 15 to 18 cm long, pyramidal, all parts densely lepidote with pale-brown, small, appressed or subappressed scales, the bracts few, lanceolate, 7 to 12 mm long, the bracteoles 2 mm long or less, the primary branches somewhat spreading, few, opposite, about 8 cm long. Male flowers 5-merous, rather densely crowded at the ends of the branchlets. Calyx cup-shaped, 3.5 to 4 mm in diameter, obscurely 5-toothed, outside densely lepidote. Petals broadly obovate to subrhomboid-obovate, 3.5 mm in diameter, somewhat narrowed below. Stamens 10; filaments 2 mm long; anthers about as long as the filaments. Ovary entirely wanting.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 16545 Ramos*, October 2, 1912, in forests.

A species also manifestly polygamo-dioecious, well characterized by its comparatively large leaves which are densely pale-brownish-lepidote beneath, and its ample panicles of rather large male flowers.

EXCLUDED SPECIES

ASTRONIA CALYCINA Vid. Rev. Pl. Vasc. Filip. (1886) 136; Cogn. in DC. Monog. Phan. 7 (1891) 1095=*Astrocalyx calycina* (Vid.) Merr. (*Astrocalyx pleiosandra* Merr.)

ATRONIA MACROPHYLLA Blume; F.-Vill. Novis. App. (1880) 89; Merr. in Forestry Bureau Bull. (Philip.) 1 (1903) 45.

ASTRONIA SMILICIFOLIA Triana; F.-Vill. l. c.

ASTRONIA SPECTABILIS Blume; F.-Vill. l. c., and var. INTERMEDIA Miq.; Vidal Sinopsis Atlas (1883) 27, *t. 51, f. A*.

The last three species have apparently been credited to the Philippines on erroneously determined specimens.

3. EVERETTIA gen. nov.

Flores 5- vel 6-meri. Calycis campanulatus, limbus regulariter 5- vel 6-lobatus, lobis ovatis, persistentibus. Petala elliptica, obtusa, imbricata. Stamina petalorum numero dupla, aequalia, filamentis complanatis; antherae anguste oblongae, utrinque obtusae, loculis rimis anticis dehiscentibus, connectivo basi non producto, inappendiculato. Ovarium calyci omnino adhaerens, 5- vel 6-loculare; stylus elongatus, stigmate punctiformi; ovula in loculis numerosissima, placentis angulo interno inferiorque loculorum affixis, erectis. Capsula depresso-subglobosa, calyce coriaceo inclusa. Semina minuta, linearia, obscure tetragona. Arbor, ramis robustis, obtuse tetragonis vel subteretibus, junioribus petiolis subtus foliis inflorescentiisque castaneo- vel brunneo-furfuraceis. Folia petiolata, opposita, coriacea, oblonga, integerrima, supra glabra, subtus densissime brunneo-furfuracea,

3-nervia et prominente penninervia, nerviis intramarginalibus prominentibus. Flores magni, breviter pedicellati, ebracteolati, in cymas breves terminales dispositi.

EVERETTIA PULCHERRIMA sp. nov. (Plate XII.)

Arbor circiter 15 m alta; foliis oppositis, longe petolatis, oblongis, coriaceis, usque ad 15 cm longis, acuminatis, basi rotundatis, 3-nerviis, nervis lateralibus submarginalibus, nervis transversalibus circiter 15 utrinque, prominentibus, supra glabris, subtus dense brunneo- vel ferrugineo-furfuraceis, vel vetustioribus subglabris, calycis circiter 1.5 cm longis.

A tree about 15 m high. Branches stout, the branchlets obscurely and obtusely 4-angled or subterete, dark-brown, minutely and densely furfuraceous as are the petioles and cymes, the lenticels large, especially near the nodes. Leaves opposite, oblong, coriaceous, 10 to 15 cm long, 2.5 to 6.5 cm wide, entire, the base acute or obtuse, the apex somewhat acuminate or acute, the upper surface pale and yellowish-green when dry, shining, quite glabrous, the lower surface very densely and minutely furfuraceous, brown or somewhat reddish-brown, in very old leaves pale or green and subglabrous; midrib prominent, the nerves 2, extending from the base to the apex at from 1 to 3 mm from the margin, straight, as prominent as, and anastomosing with the lateral nerves; lateral nerves about 15 on each side of the midrib, straight, not at all curved at their attachment with the marginal nerves, prominent, the secondary transverse nerves sometimes nearly as prominent as the primary ones; petioles 4 to 5 cm long. Cymes terminal, many-flowered, shortly pedunculed, 6 to 12 cm long. Flowers large, 5- or 6-merous, the pedicels 5 mm long or less, ebracteolate. Calyx campanulate, about 1.5 cm long, the outside densely brown-furfuraceous, the lobes 5 or 6, ovate, abruptly short-acuminate or acute, about 5 mm long. Petals 5 or 6, pink, or white and pink, elliptic, in nearly mature bud 1.6 cm long, obtuse. Stamens 10 or 12, in two rows, equal or subequal; filaments flattened below, about 1.5 cm long; anthers oblong, obtuse, 5 to 6 mm long, basifixed, connective not at all produced, inappendiculate. Style cylindric, about 1.8 cm long. Capsule included in the persistent calyx, depressed-globose, the apex truncate or depressed, about 1 cm in diameter, 5- or 6-celled. Seeds very numerous, linear, about 2 mm long, obscurely 4-angled, slightly narrowed below.

NEGROS, Mount Silay, *Whitford 1538*, May, 1906, on exposed ridges 100 to 1200 m altitude; Canlaon Volcano, *Phil. Pl. 249 Merrill*, April, 1910, in

forests, altitude 1200 to 1400 m; Cuernos Mountains, *Elmer 10225*, June, 1908. LEYTE, Dagami, *Bur. Sci. 15291 Ramos*, August, 1912. MINDANAO, Province of Misamis, Mount Malindang, *For. Bur. 4690 Mearns & Hutchinson* (type), May, 1906, altitude about 1400 m: District of Davao, Mount Apo, *Elmer 11425*, August, 1909.

This proposed genus in most essential characters is very similar and manifestly closely allied to *Beccarianthus* Cogn., of which two species are known, one from Borneo and one from Mindanao. The type of that genus, *Beccarianthus pulcher* Cogn., has 5-nerved leaves and long-papillose branchlets and inflorescences. The Mindanao species, *B. ickisii* Merr., has 7- or 9-nerved leaves, the younger parts only sparingly papillose. *Everettia* is not at all papillose, but the young branches, lower surfaces of the leaves and the inflorescences are densely covered with brown furfuraceous scales, which may disappear to a large extent in very old leaves. The leaves in their venation are entirely different from those of *Beccarianthus*, having a prominent midrib and a single pair of intramarginal or submarginal nerves extending from the base to the apex, at most 5 mm distant from the margin of the leaf, usually much nearer this, and about as prominent as the spreading horizontal nerves which connect the midrib with the marginal ones.

The genus is dedicated to Mr. H. D. Everett, formerly a forester in the Phlippine Bureau of Forestry, and who made extensive botanical collections in Negros.

In May, 1908, Mr. Everett, accompanied by Mr. T. R. Wakely, an American teacher, and the following Filipinos, Messrs. J. Leaño, R. Leaño, and J. Aman, the first two rangers in the Forestry Bureau, started on a trip across southern Negros. The entire party was killed by the wild people of the interior, in the mountains back of Bayauan, on or about May 11, 1908. Nonarrival of the party led to a search being made, with the result that their remains were found at the place where they were killed. The remains were brought to Manila and interred in the Cementerio del Norte, where a suitable monument has been erected to the memory of all members of the ill-fated expedition.

4. BECCARIANTHUS Cogn.

BECCARIANTHUS ICKISII sp. nov.

Arbor circiter 15 m alta, ramulis subtus foliisque minutissime furfuraceis, petiolis ramulisque parcissime papillosis; foliis chartaceis vel subcoriaceis, ovato-ellipticis, longe petiolatis, 20 ad 40 cm longis, breviter acuminatis, basi late rotundatis vel obscure cordatis, 7- ad 9-nerviis, nervis transversalibus numerosis, prominentibus; inflorescentiis terminalibus, usque ad 10 cm longis, densifloris; floribus rubris, circiter 3.5 cm longis, calycis dentibus circiter 1 mm longis.

A tree about 15 m high. Branches stout, subterete, the ultimate ones about 1 cm in diameter, the growing parts minutely

brownish-furfuraceous and with few, scattered, rather stout and soft, pale-brown papillae up to 8 mm in length. Leaves opposite, ovate-elliptic, chartaceous or subcoriaceous, 20 to 40 cm long, 12 to 25 cm wide, apex shortly acuminate, base broad, rounded or slightly cordate, the upper surface glabrous and shining, pale yellowish-green when dry, the lower surface brownish, minutely and rather densely brownish-furfuraceous; nerves 7 to 9 from the base, the inner five prominent and reaching to the apex of the leaf, the outer two pairs more slender, the outermost, when present, submarginal; transverse veinlets subparallel, numerous, prominent; petioles 8 to 20 cm long, with scattered papillae similar to those on the ultimate branchlets. Inflorescence terminal, dense, many-flowered, 10 cm long or less, all parts minutely brown-furfuraceous, not papillose or setose, the branches opposite, the branchlets somewhat whorled; bracts lanceolate to narrowly lanceolate, acuminate, 1.5 to 2 cm long. Flowers red, subumbellately disposed at the ends of the branchlets, their pedicels 1 to 2 cm long. Calyx somewhat campanulate, about 1 cm long, truncate, with 5, distant, small teeth 1 mm long or less. Petals 5, thick, imbricate, inequilateral, base rather broad, apex acuminate, oblong, about 3 cm long, 1 cm wide. Stamens 10; filaments 3 to 3.5 cm long, about 1.5 mm wide, flattened; anthers oblong, about as wide as the filament, continuous with it, 5 to 6 mm long, connective not at all produced, not spurred or auricled. Ovary 5-celled; ovules very numerous on all sides of the ascending placentae, the placentae attached at the lower inner angles of the cells; style slender, about 2.5 cm long; stigma punctiform. Fruit unknown.

MINDANAO, Butuan Subprovince, Agusan Valley, in dense, damp forests on the Umuayan River near Waloe, altitude about 50 m, *Merrill 7342*, October 2, 1910.

This beautiful and very characteristic species is dedicated to the memory of Mr. H. M. Ickis, late of the Division of Mines, Bureau of Science, who was killed by the Manobos on the Umuayan River above Waloe in April, 1908.

Beccarianthus has previously been a monotypic genus confined to Borneo, represented only by *Beccarianthus pulcher* Cogn., from Sarawak. The present form is manifestly referable to the same genus, but differs in its much larger leaves which are 7-nerved, and in its floral characters. Through the kindness of Doctor Beccari I have been able to examine a fragment of the type of the genus *Beccarianthus*, which was kindly loaned to me at the time I was working out the relationships of the proposed genus *Everettia* to *Beccarianthus*.

EXCLUDED GENERA

KIBESSIA SIMPLEX Korth; F.-Vill. Novis. App. (1880) 89. This species has been erroneously credited to the Philippines by several authors on the basis of *Cuming 2337*, which was distributed with a Philippine label, but which was from Malacca, not from the Philippines. Its proper name is *Kibessia echinata* (Jack) Cogn., and it is definitely known only from Penang, the Malay Peninsula, Singapore, and Borneo. See Vidal Phan. Cuming. Philip. (1885) XII; Rolfe in Journ. Linn. Soc. Bot. 21 (1884) 281.

KIBESSIA CORDATA Korth; F.-Vill. l. c. Admitted as Philippine probably on an erroneous identification; it is known only from Sumatra.

KIBESSIA TUBERCULATA Hook. f.; Vidal Sinopsis Atlas (1883) 27, *t. 51, f. C.* The specimen from which the drawing was made was from Binagonan de Lampon, Infanta, Tayabas Province, Luzon. The identification is probably incorrect.

PTERNANDRA CAERULESCENS Jack; F.-Vill. l. c. Erroneously credited to the Philippines on the basis of *Cuming 2316*, distributed with a Philippine label. The specimen is from Malacca, not the Philippines. See Rolfe in Journ. Linn. Soc. Bot. 21 (1884) 287; Vidal Phan. Cuming. Philip. (1885) XII.

EXPLANATION OF THE PLATES

(Drawings by T. S. Espinosa)

PLATE XI. Astrocalyx calycinus (Vid.) Merr. Fig. A, a leafy branch showing the inflorescence, reduced about ⅔; B, a mature bud, ×2; C, an open flower, ×2; D, a mature fruit, ×3; E, a stamen, ×4; F, a seed, ×15.

XII. Everettia pulcherrima Merr. A, a leafy branch showing the inflorescence, reduced nearly ⅔; B, stamens, side and lateral views, ×2.5; C, a petal (immature), ×2.6; D, cross-section of a mature fruit, ×2.5.

PLATE XI. ASTROCALYX CALYCINA (Vid.) Merr.

PLATE XII. EVERETTIA PULCHERRIMA Merr.

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PLANTAE WENZELIANAE

By E. D. MERRILL *

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

In July of the present year I received for identification a comparatively small collection of plants made by Mr. C. A. Wenzel, a resident of Dagami, Leyte. The collection presented such a high percentage of novelties that it has been considered best to describe the apparently new species, represented in the collection, in a separate paper. The collection received totaled 300 numbers, representing about 275 species, of which about thirty-five are apparently undescribed. In the present paper twenty-eight species are included, the material in each case being sufficiently complete to warrant the preparation of diagnoses and descriptions. The remaining novelties will of necessity have to be considered at a later date when more ample material is available for study.

Most of the specimens were collected near Dagami, Leyte, and for the most part in forests below an altitude of 100 meters. It is to be hoped that Mr. Wenzel will continue his botanical exploration of the region, which is, apparently, one of very great interest.

CYPERACEAE

SCLERIA Bergius

SCLERIA TRIGONA sp. nov. (§ *Hypoporum.*)

Herba perennis, robusta, circiter 1 m alta, subglabra; vaginis laxis, purpureis, foliis usque ad 70 cm longis, 1.5 cm latis, margine scabridis, chartaceis, longe acuminatis, base leviter angustatis; paniculis corymbosis, foliosis, angustis, circiter 20 cm longis; spiculis ut videtur omnibus bisexualis, 4 ad 5 mm longis; nuculis albis, laevis, 2 ad 2.5 mm longis, acutis, prominente trigonis, leviter hirsutis.

An erect, tufted, perennial plant about 1 m high, the sheaths in their upper parts, and the inflorescence more or less pubescent,

*Associate Professor of Botany, University of the Philippines, Manila, P. I.

otherwise nearly glabrous, the stems 3-angled, about 5 mm in diameter, glabrous, not scabrid on the angles, quite hidden by the rather lax, purple, overlapping sheaths. Leaves up to 70 cm long, about 1.5 cm wide, chartaceous, gradually narrowed upward to the long and slender acuminate apex, slightly narrowed below and gradually passing into the sheaths, the margins scabrid, the midrib usually purple; sheaths lax, sparingly pubescent, purple. Inflorescence a narrow, terminal, corymbose, leafy panicle, the primary branches distant, 6 to 12, 4 to 8 cm long, many-flowered, each subtended by a leaf, the upper leaves gradually shorter, the lower ones similar to those of the stem but somewhat smaller, the rachis and branchlets 3-angled, sparingly ciliate-hispid. Spikelets apparently all bisexual, lanceolate in flower to ovate in fruit, 4 to 5 mm long, sessile or very shortly pedicelled, numerous, each subtended by a linear, scabrid, leaf-like bracteole, 6 to 10 mm long. Empty glumes usually 3, lanceolate to ovate, acuminate, keeled, distichous, 2.5 to 3 mm long; first flowering glume containing a female flower, submembranaceous, about 3.5 mm long, 2 mm wide, somewhat keeled, acuminate; second flowering glume similar to the first, containing a male flower, the third and fourth (when present) thin, narrowly oblong to spatulate, each containing a male flower or the uppermost one empty. Stamens 3; anthers linear, 2 mm long, long-apiculate; filaments about 3 mm long. Ovary of the female flower narrow, somewhat pubescent; style 0.5 mm long, the arms 3, slender, 4 to 5 mm long. Nutlet bony, white, 2 to 2.5 mm long, smooth, shining, acute, prominently 3-angled, sparingly appressed-pubescent with brown hairs, the gynophore white, prominent, broadly 3-lobed, nearly 1 mm high and about as wide as the base of the nutlet.

LEYTE, Dagami, *C. A. Wenzel 158*, June 18, 1913, in forests. Apparently most closely allied to *Scleria corymbosa* Roxb., but entirely different from our specimens of that species, and from its descriptions. It manifestly belongs in the section *Hypoporum*. Its striking features are its loose, not winged, purple sheaths, its relatively large leaves, its narrow, interrupted, leafy panicles, and its smooth, shining, more or less ferruginous-pubescent, acute, prominently 3-angled nutlets.

MORACEAE

FICUS Linnaeus

FICUS EUPHLEBIA sp. nov. (§ *Sycidium*.)

Frutex 1.5 m altus, ramulis foliisque utrinque minute scaberulis; foliis alternis, oblongis ad anguste ovato-oblongis, chartaceis, usque ad 20 cm longis, equilateralibus, basi rotundatis vel

subobtusis, 3-nerviis, apice subcaudato-acuminatis, margine irregulariter repando-serratis, in siccitate pallidis, nitidis, nervis utrinque circiter 10, subtus valde prominentibus; receptaculis globosis, aurantiacis, scabridis, pedunculatis, axillaribus, fasciculatis, circiter 1 cm diametro.

A shrub about 1.5 m high. Branches terete, pale-brownish, the ultimate ones 2 to 2.5 mm in diameter, minutely scabrid. Leaves alternate, equilateral, rather distant, oblong to narrowly oblong-ovate, 15 to 20 cm long, 3.5 to 7 cm wide, rather gradually narrowed upward to the subcaudate-acuminate apex, the acumen minutely apiculate, 1.5 to 2 cm long, the base rounded or somewhat obtuse, equilateral, 3-nerved, the margins unequally repand-dentate, the teeth broad, short, 5 to 10 mm apart, sinuses often obscure, both surfaces minutely scabrid, when dry pale, somewhat shining; lateral nerves about 10 on each side of the midrib, very prominent on the lower surface, curved, anastomosing near the margin, the reticulations subparallel, prominent; petioles densely scabrid, 2 to 3 mm long; stipules linear, acuminate, scabrid, about 7 mm long. Receptacles fascicled, axillary, 1 to 5 in each axil, the peduncles rather stout, 3 to 5 mm long, scabrid, the basal bracts few, broadly triangular, the apical 3 forming a whorl at the base of the receptacle, broadly triangular, acute, about 1 mm long, wider than long, margins ciliate-hispid; receptacles globose, about 1 cm in diameter, yellow, scabrid. Fertile female flowers numerous, sessile or subsessile, the ovary broadly ovoid to ovoid, somewhat inequilateral, 1.2 mm long, rounded at the apex, the style at the angle or distinctly lateral, slender, 1 to 1.8 mm long.

LEYTE, Dagami, *C. A. Wenzel 52*, March 15, 1913, in forests near small streams.

Presumably belonging in the section *Sycidium*, although the male flowers have not been seen. The species is manifestly allied to the *ulmifolia* (*sinuosa*) group, but has equilateral leaves which are prominently acuminate, and somewhat smaller receptacles than has *Ficus ulmifolia* Lam.

FICUS PACHYPHYLLA sp. nov. (§ *Urostigma.*).

Species *F. callophyllae* Bl. ut videtur valde affinis, omnibus partibus glabris; foliis crasse coriaceis, oblongis ad ellipticis, 10 ad 15 cm longis, breviter late obtuseque acuminatis, basi 3-plinerviis, subtus minutissime dense puncticulatis; nervis primariis utrinque circiter 12; receptaculis axillaribus, sessilibus, globosis, 1.3 ad 1.5 cm diametro, in siccitate valde laxe rugosis, bracteis persistentibus, late ovatis, circiter 1 cm longis.

A tree, apparently starting as an epiphyte, 6 to 10 m high or more, entirely glabrous. Branches terete, brownish, prominently wrinkled when dry, the ultimate ones 3 to 4 mm in diameter. Leaves thickly coriaceous, oblong to elliptic, 10 to 15 cm long, 4.5 to 8 cm wide, pale-brownish and somewhat shining when dry, smooth, entire, apex broadly and shortly blunt-acumnate, base acute to somewhat rounded, distinctly 3-plinerved, sometimes with a very obscure slender pair of submarginal nerves added, margins slightly recurved, the lower surface densely and minutely puncticulate; primary lateral nerves about 12 on each side of the midrib, slender, straight or but slightly curved, sometimes not much more prominent than are the secondary ones, anastomosing with a slender, somewhat arched-anastomosing, continuous, submarginal nerve within about 2 mm of the margin; petioles 2.5 to 3.5 cm long; stipules deciduous, lanceolate, glabrous, long-acuminate, 2 to 2.7 cm long. Receptacles solitary or in pairs, axillary, sessile, globose, red when mature, glabrous, 1.3 to 1.5 cm in diameter, laxly and prominently wrinkled when dry, prominently umbonate at the apex, each receptacle subtended by an involucre of three, persistent, coriaceous, broadly ovate, obtuse or broadly acute bracts about 1 cm in length, brown when dry.

LEYTE, Dagami, *C. A. Wenzel 209* (type), June 27, 1913, in forests. To this species I also refer the following specimens: LUZON, Province of Laguna, Pililla-Mavitac trail, *Bur. Sci. 11950 Robinson & Ramos.* NEGROS, *For. Bur. 4264 Everett.* MINDANAO, District of Zamboanga, *Hallier s. n.*

The species is manifestly allied to the Javan *Ficus callophylla* Blume, but is apparently sufficiently distinct. Javan specimens, so named, present numerous minor characters in which the species differs from the form here described. King's plate is unsatisfactory as it was drawn from an immature specimen, and to me Blume's species does not appear to be closely allied to *Ficus elastica* as King claims. The minutely puncticulate lower surfaces of the leaves of *Ficus pachyphylla* is apparently characteristic for the species. *Ficus pachyphylla* is also closely allied to *Ficus clusioides* Miq., a species based on an immature specimen collected in the Philippines by Cuming.

FICUS VIRIDIFOLIA sp. nov. (§ *Paleomorphe.*)

Frutex circiter 4 m altus, ramulis teretibus, elongatis, leviter hispidis; foliis alternis, brevissime petiolatis, chartaceis, plus minusve hispidis, oblongis ad oblongo-lanceolatis, leviter falcatis, integris, usque ad 25 cm longis, apice tenuiter longe caudato-acuminatis, basi inaequilateralibus, distincte obliquiis, in siccitate utrinque viridis, nervis utrinque circiter 12, remotis, prominentibus, anastomosantibus; receptaculis axillaribus, fasciculatis, pedunculatis, subglobosis ad globoso-ovoideis, hispidis, 5 ad 7 mm diametro.

A shrub about 4 m high. Branchlets terete, slender, pale-brown, somewhat striate-wrinkled when dry, somewhat hispid with short, scattered, stiff hairs. Leaves alternate, narrowly oblong to oblong-lanceolate, somewhat falcate, chartaceous, entire, rather bright-green on both surfaces when dry, somewhat shining, distinctly roughened by minute papillae on both surfaces, 22 to 25 cm long, 6 to 7 cm wide, the base inequilateral, distinctly oblique, one side acute, the other narrowly rounded and extending along the midrib several mm farther than the narrower side, the apex long and slenderly caudate-acuminate, the acumen 2 to 2.5 cm long; lateral nerves about 12 on each side of the midrib, prominent, distant, anastomosing, the reticulations lax, distinct; petioles about 2 mm long, hispid-hirsute; stipules lanceolate, acuminate, about 1 mm long. Receptacles axillary, fascicled, up to 6 in each axil, red, subglobose to globose-ovoid, 5 to 7 mm in diameter, externally scabrid-hispid, the peduncles hispid-hirsute, about 3 mm long, each with about 3, distant, scattered, ovate to oblong-ovate bracts less than 1 mm long, and also with usually 2 or 3 similar bracts on the lower one-half of the receptacle itself. Fertile female flowers numerous, sessile, the perianth membranaceous, deeply cut into 4, narrowly lanceolate, sparingly hispid, 2 to 2.2 mm long lobes, the ovary narrowly oblong-ovoid, strongly inequilateral, 1.5 mm long, smooth, the base subtruncate, attached by one side, the apex obtuse, bearing the style on the same side as the basal attachment, the style about 1 mm long, narrowly clavate.

LEYTE, Dagami, *C. A. Wenzel 145*, June 22, 1913, in forests, the trunk reaching a diameter of 10 cm.

A species apparently manifestly allied to *Ficus celebica* Blume, *F. pisifera* Wall., etc., but distinguished at once by its much longer, more numerously nerved leaves.

FICUS WENZELII sp. nov. (§ *Sycidium ?*)

Frutex circiter 4 m altus, plus minusve hirsutus; ramulis teretibus, hirsutis, brunneis; foliis late obovatis ad obovatis vel ovatis, chartaceis vel subcoriaceis, usque ad 30 cm longis, subintegris, apice tenuiter acuminatis, basi leviter inaequilateraliter cordatis, 7- vel 9-nerviis, in siccitate subtus brunneis, puncticulatis, parce hispido-hirsutis, nervis lateralibus utrinque circiter 10; receptaculis hirsutis, axillaribus, solitariis, late obovoideis, 1 ad 1.5 cm diametro (immaturis).

A shrub about 4 m high. Branches brown, terete, prominently hirsute, the ultimate ones about 5 mm in diameter. Leaves opposite, firmly chartaceous to subcoriaceous, broadly obovate to

obovate or even ovate, the larger ones 25 to 30 cm long, 10 to 16 cm wide, margins subentire or very obscurely toothed, somewhat narrowed above to the rather slenderly acuminate apex, slightly narrowed below to the somewhat inequilateral, broadly cordate base, the sinus very shallow, the lobes broadly rounded, usually with 3 or 4 short basal nerves on each side of the midrib, when dry the upper surface brownish-olivaceous, somewhat shining, sparingly ciliate-hirsute on the midrib and nerves, minutely scabrid, the lower surface brown, ciliate-hirsute on the midrib and nerves with scattered, stiff, white hairs, the surface puncticulate; lateral nerves about 10 on each side of the midrib, prominent on the lower surface, anastomosing, the primary reticulations subparallel, prominent; petioles more or less hirsute, of the larger leaves 4 to 5.5 cm long. Receptacles axillary, sessile, broadly obovoid or even depressed-globose (immature) 1 to 1.5 mm long, sparingly hirsute, the basal bracts 3, broadly ovate, 2 to 3 mm long, somewhat pubescent. Flowers very numerous, sessile and pedicelled, all female (or some gall flowers?), the ovaries ovoid to subglobose, inequilateral, 0.5 mm long; style usually distinctly terminal, 1 mm long.

LEYTE, Dagami, *C. A. Wenzel 48*, March, 1913, in abacá (*Musa textilis*) plantations, edge of foothills, altitude 60 meters.

A species with leaves in form peculiarly like those of the common Philippine *Ficus nota* (Blanco) Merr., but otherwise not at all closely allied to that species. Its exact alliances are not clear to me, for I know no Philippine or extra-Philippine form that it closely resembles.

URTICACEAE

BOEHMERIA Jacquin

BOEHMERIA CYPHOLOPHOIDES sp. nov.

Species ut videtur *B. blumeae* et *B. heterophyllae* affinis, differt foliis omnibus alternis, isomorphis, basi aequilateraliter rotundatis.

A shrub about 2 m high, somewhat pubescent, the branches reddish-brown, terete, slender, striate when dry, glabrous, the younger parts rather densely cinereous-pubescent. Leaves all alternate, all alike in shape, and for the most part alike in size on the same parts of the branches, oblong-ovate to ovate to ovate-elliptic, chartaceous, 6 to 13 cm long, 2.5 to 4 cm wide, olivaceous when dry, lower surface slightly paler then the upper, the latter shining, glabrous, the lower cinereous-pubescent on the midrib and nerves and to a less degree on the reticulations, the apex slenderly subcaudate-acuminate, the base equilateral, rounded,

3-nerved, the basal nerves reaching above the middle of the leaf, the margins dentate-crenulate; lateral nerves above the basal pair about 4 on each side of the midrib, ascending, distinct. Glomerules of pistillate flowers mostly on the branches below the leaves in the axils of fallen leaves, depressed-globose, sessile, 5 to 7 mm in diameter, densely many-flowered, the flowers green, the subtending bracts linear-lanceolate, acuminate, about 1 mm long, numerous. Perianth sparingly hirsute, membranaceous, the inflated part surrounding the achenes about 1.4 mm long, abruptly contracted into a very slender, 1 mm long, hirsute tube closely investing the style, minutely and slenderly 3-lobed at the apex. Achenes obliquely obovoid, slightly compressed, smooth, about 1.2 mm long, the apex obtuse or rounded, base narrowed, acute; style slender, much-curved, 3 to 3.5 mm long. Staminate flowers not seen.

LEYTE, Dagami, *C. A. Wenzel 35*, May 20, 1913, in forested foothills, altitude about 60 meters.

Apparently a dioecious species, in its equilateral leaves and its much-curved styles strongly resembling such species of *Cyphophus* as *C. lutescens* Wedd., and *C. brunneolus* Elm., differing, however, from *Cyphophus* in its membranaceous perianths, long styles, and alternate leaves. It is manifestly allied to *Boehmeria blumei* Wedd. and *B. heterophylla* Wedd., but has always isomorphous alternate leaves which are not in the slightest degree inequilateral.

PROCRIS Commerson

PROCRIS DOLICHOPHYLLA sp. nov.

Frutex scandens *P. frutescens* Bl. affinis, differt foliis majoribus, usque ad 37 cm longis, nervis magis numerosis, utrinque circiter 15, folia abortiva oblonga, 2 cm longa, basi prominente cordata.

A scandent plant 5 m in length, nearly glabrous, the stems 5 m long, 3 cm in diameter, the branches stout, apparently somewhat fleshy when fresh, grayish or dark-colored when dry. Leaves very unequal, the larger of each pair narrowly oblong-obovate to broadly oblong-oblanceolate, slightly falcate, chartaceous when dry, 30 to 37 cm long, 7 to 9 cm wide, slightly shining, when dry brown on the upper surface, much paler on the lower surface which is distinctly brown-furfuraceous on the midrib, nerves, and reticulations, cystoliths prominent on both surfaces, the apex abruptly short-acuminate, the base gradually narrowed, decurrent-acuminate, nearly equilateral; lateral nerves about 15 on each side of the midrib, curved-ascending, prominent, the reticulations very lax, prominent; petioles 5 to 7 mm long; aborted leaves stipule-like, sessile, oblong to oblong-ovate, about 2 cm

long, 8 to 10 mm wide, obtuse, base prominently cordate, the basal auricles half amplexicaul. Female inflorescence axillary, depressed-globose, sessile, solitary, 1 to 1.5 cm in diameter, very dense. Perianth-segments 3 or 4, spatulate to oblong-oblanceolate, 1.5 mm long, the apical part somewhat cucullate, obtuse, base long narrowed. Achenes narrowly elliptic to oblong-ovoid, acute, smooth, shining, 1 mm long. Staminate inflorescence not seen.

LEYTE, Dagami, *C. A. Wenzel 98*, March 29, 1913, climbing on trees in forested foothills, altitude about 60 meters.

A species apparently sufficiently distinct from *Procris frutescens* Blume and *P. pedunculata* Wedd., to both of which it is manifestly allied. It has much larger, more numerously nerved leaves than either, and the prominently cordate, oblong to oblong-ovate, sessile, somewhat amplexicaul abortive leaves seems to be characteristic.

LORANTHACEAE

LORANTHUS Linnaeus

LORANTHUS WENZELII sp. nov. (§ *Heteranthus.*)

Frutex parasiticus, scandens, glaber, ramis ramulisque teretibus; foliis verticellatis, ternis vel quarternis, crasse coriaceis, ovato-ellipticis vel oblongo-ellipticis, utrinque subaequaliter angustatis, apice acuminatis, basi acutis, petiolatis, usque ad 18 cm longis, nervis lateralibus obscuris; floribus 5-meris, circiter 2 cm longis, solitariis vel leviter fasciculatis, breviter pedicellatis, axillaribus vel extra-axillaribus.

A parasitic, scandent, glabrous shrub, the branches and branchlets terete, the former light grayish-brown, the latter smooth, about 3 mm in diameter, dark-brown, often somewhat compressed at the nodes, the internodes 8 to 10 cm long. Leaves whorled, 3 or 4 at each node, oblong-elliptic to ovate-elliptic, 12 to 18 cm long, 5.5 to 8 cm wide, thickly coriaceous, somewhat brownish and dull when dry, about equally narrowed to the prominently and usually slenderly acuminate apex and to the acute base; lateral nerves 6 to 8 on each side of the midrib, slender, obscure; petioles stout, 1.5 to 3 cm long. Flowers yellow, 5-merous, solitary or few together, axillary or along the branches between the nodes, their pedicels 1 to 1.5 mm long, the solitary apical bracteole orbicular-ovate, concave, rounded, 1.2 mm long, about 2 mm wide. Calyx somewhat funnel-shaped, 3 mm long, 2.5 mm in diameter at the apex, the limb slightly produced, truncate. Petals 5, entirely free, about 17 mm long, 1.5 mm wide at the base, somewhat enlarged

upward and 3 mm wide opposite the insertion of the stamens, the reflexed part above the stamens narrowed upward to the acute apex, about 5.5 mm long. Filaments 1 mm long; anthers narrowly oblong, continuous, 3 to 3.5 mm long.

LEYTE, Dagami, climbing on trees in forests, altitude about 60 meters, *C. A. Wenzel 24*, April 20, 1913.

A strongly marked species, well characterized by its solitary or nearly solitary, short-pedicelled, axillary and extra-axillary flowers in combination with its thickly coriaceous, verticellate leaves. It is allied to *Loranthus lanaensis Merr.*, which has, however, opposite or subopposite leaves, larger flowers, and cymose inflorescences.

ANONACEAE

POLYALTHIA Blume

POLYALTHIA SIMILIS sp. nov. (§ *Eupolyalthia.*)

Species *P. obliquae* Hook. f. et Th. similis et valde affinis, differt floribus paullo majoribus, breviter pedicellatis, saepe geminatis, et foliis chartaceis vix coriaceis.

A shrub or small tree 4 to 5 m high. Branches terete, dark-gray, lenticellate, glabrous, the younger parts distinctly pubescent. Leaves oblong to oblong-lanceolate, chartaceous, shining, pale when dry, 10 to 18 cm long, 2 to 6.5 cm wide, the apex shortly acuminate, the base narrowed and distinctly althoughly minutely inequilaterally cordate, the upper surface quite glabrous when dry, the lower paler, sparingly appressed-pubescent along the midrib, the lateral nerves about 12 on each side of the midrib, slender, distinct, looped-anastomosing, the reticulations lax; petioles stout, 2 mm long or less. Flowers green or yellowish, solitary or in pairs from the axils of fallen leaves and from the branches below the leaves, their pedicels stout, somewhat pubescent, 2 to 3 mm long, bracteate at the base. Sepals reniform to broadly ovate, thickly coriaceous, 3 to 4 mm long, 5 mm wide, obtuse, slightly pubescent externally. Outer three petals oblong-ovate, coriaceous, recurved, densely ferruginous-pubescent externally, inside glabrous, obtuse, about 10 mm long, 6 mm wide, the inner three similar but more erect, narrowly oblong, about 8 mm long, 4 mm wide. Stamens many, narrowly oblong-obovate, the connectives truncate, 1.2 mm long. Carpels many, oblong, 1 to 1.5 mm long, pubescent below; stigmas subcapitate; ovules two, basal or subbasal.

LEYTE, Dagami, *Bur. Sci. 15185 Ramos* (type), August 9, 1912, *C. A. Wenzel 91*, March, 1913, in damp forests.

A species manifestly very closely allied to the Malayan *Polyalthia obliqua* Hook. f. & Th., which is reported from Chittagong, the Malay Peninsula,

Sumatra, and Borneo. As that species is described, however, the Philippine plant differs in its thinner leaves which apparently have more numerous nerves, and its somewhat larger flowers which are often borne in pairs. Comparison with authentic material may, however, show them to be identical.

CONNARACEAE

ROUREA Aublet

ROUREA UNIFOLIOLATA sp. nov.

Species *R. volubilis* (Blanco) Merr. affinis, differt foliis omnibus unifoliolatis, foliolis majoribus, longe subcaudato-acuminatis, inflorescentiis laxioribus.

A woody vine reaching a height of 20 m and a diameter of 4 cm, quite glabrous. Branches brown, shining, terete, slightly wrinkled when dry. Leaves alternate, simple, subcoriaceous, pale and strongly shining on both surfaces when dry, oblong-ovate, 9 to 15 cm long, 4 to 6 cm wide, the apex long and rather slenderly subcaudate-acuminate, the acumen blunt, up to 2 cm long, the base somewhat narrowed and acute or somewhat obtuse; lateral nerves 4 or 5 on each side of the midrib, curved-ascending, slender, distinct, anastomosing, the reticulations slender, distinct, the lower two pairs of nerves leaving the midrib near the base, the others distant; petioles 2 to 5 cm long, jointed to the 5 mm long petiolule of the solitary leaflet. Panicles axillary, fascicled, up to 11 cm long, the shorter ones sometimes reduced to racemes. Flowers white or pink. Sepals ovate, acute or somewhat acuminate, 3.5 to 4 mm long, their margins very minutely and shortly ciliate. Petals oblanceolate, 8 mm long, 2 mm wide, acute or obtuse, narrowed below. Anthers 0.8 mm long.

LEYTE, Dagami, *C. A. Wenzel 36*, May 20, 1913, in forests, altitude about 60 meters.

Similar to some forms of *Rourea volubilis* (Blanco) Merr., but with always simple leaves.

BURSERACEAE

CANARIUM Linnaeus

CANARIUM EUPHLEBIUM sp. nov. (§ *Monadelphia.*)

Arbor circiter 17 m alta, leviter hirsuta; foliis 20 ad 25 cm longis, 3- vel 4-foliolatis, pinnatis; stipulis setaceis, hirsutis, 7 ad 10 mm longis; foliolis coriaceis, in siccitate utrinque viridis, nitidis, oblongis ad oblongo-ellipticis, usque ad 15 cm longis, breviter acuminatis, margine obscure denticulatis, denticulis valde fasciculato-ciliatis, nervis lateralibus utrinque circiter 15,

subtus cum reticulis valde prominentibus, costa nervisque utrinque leviter ciliato-hirsutis; inflorescentiis spicatis, axillaribus, usque ad 10 cm longis; floribus ♂ fasciculatis, 3-meris, circiter 1 cm longis (vel longioribus), filamentis basi connatis, disco apice valde ciliato.

A tree about 17 m high. Branches terete, pale-gray, the ultimate ones 3 to 4 mm in diameter, glabrous, the younger branchlets more or less hirsute or ciliate-hirsute with stiff, short or elongated, pale-brownish hairs. Leaves alternate, 20 to 25 cm long, pinnately 3- or 4-foliolate, the petioles and rachis pale, slightly hirsute, glabrescent; stipules setaceous, 7 to 10 mm long, densely hirsute, persistent; leaflets oblong to oblong-elliptic, 7 to 15 cm long, 3.5 to 6 cm wide, coriaceous, green and shining on both surfaces when dry, the midrib, lateral nerves, and to a less degree the very prominent reticulations on both surfaces, with scattered, very stiff, white, setose-ciliate hairs about 1 mm long, the apex shortly acuminate, the base rounded to subacute, the margins usually somewhat recurved, distantly denticulate, a minute tooth terminating each marginal reticulation, each tooth with a tuft of stiff ciliate hairs; lateral nerves about 15 on each side of the midrib, somewhat impressed on the upper surface, very prominent on the lower, the primary reticulations often subparallel, nearly as prominent as the nerves; petiolules, 8 to 15 mm long, sparingly hirsute or ciliate, that of the terminal leaflet in trifoliolate leaves often much longer. Staminate inflorescences axillary, solitary, spicate, 7 to 10 cm long, more or less hirsute with short stiff hairs, the flowers sessile, fascicled at the nodes, rather numerous. Flowers 3-merous, yellowish. Calyx cylindric-cupular, densely pale-hirsute with short appressed hairs, 7 to 8 mm long, about 5 mm in diameter, the lobes 3, broadly ovate, 3 mm long and 4 mm wide, rounded or shortly and abruptly acuminate. Petals (in nearly mature bud) about 9 mm long, 3.5 mm wide, oblong-obovate, obtuse, externally in the upper part densely appressed-hirsute. Stamens 6, their filaments glabrous, free from the disk and outside of it, united for the lower 1 to 1.5 mm, the free parts about 4 mm long; anthers oblong, 3 mm long. Disk thick, somewhat cupular, about 1.5 mm high, glabrous except for the densely ciliate-hirsute apex which is obscurely denticulate.

LEYTE, Dagami, *C. A. Wenzel 283*, July 3, 1913, in forests.

A species strongly characterized by its very prominently nerved and reticulate leaflets which are few in number, 3 or 4, their margins minutely denticulate, each small tooth tipped with a tuft of stiff hairs, the scattered,

very stiff hairs on the nerves and reticulations, its setaceous, hirsute stipules, and its spicate inflorescence.

CANARIUM RAMOSII sp. nov. (§ *Monadelphia.*)

Arbor alta, omnibus partibus plus minusve hirsutis; foliis usque ad 50 cm longis, 4- vel 5-jugis, exstipulatis; foliolis chartaceis vel membranaceis, 15 ad 24 cm longis, integris, apice longe caudato-acuminatis, basi angustatis, acutis, inaequilateralibus; racemis axillaribus, quam folia brevioribus; floribus ♂ ad nodos fasciculatis, pedicellatis, paucis, bracteolis minutis; petalis oblongis, circiter 13 cm longis; filamentis basi breviter connatis, elongatis; disco libero, 2.5 mm longo, dense hirsuto.

A tall tree, the branches, leaves, and inflorescence distinctly hirsute with more or less scattered, few to many, spreading, somewhat brownish hairs. Branches terete, glabrous, brownish, lenticellate, the ultimate ones about 5 mm in diameter. Leaves alternate, pinnate, up to 50 cm in length, the leaflets 9 to 11, the rachis and petiolules distinctly hirsute; leaflets in general oblong, the upper ones on each leaf larger than the lower, 15 to 24 cm long, 5 to 7.5 cm wide, entire, chartaceous or membranaceous, of about the same color and equally shining on both surfaces when dry, especially hirsute along the midrib and lateral nerves on both surfaces, otherwise with very scattered hairs, the apex long and slenderly caudate-acuminate, the acumen up to 3 cm long, blunt, the base usually inequilateral, acute, sometimes rounded on the broader side; lateral nerves 9 to 12 on each side of the midrib, distinct, curved, the reticulations rather fine, distinct; petiolules hirsute, 1 to 2 cm long; stipules none. Racemes few, solitary in the uppermost axils, sometimes appearing subterminal, slender, few-flowered, 25 cm long or less, sparingly hirsute, the flowers in pairs or somewhat fascicled at the distant nodes, closer above. Flowers 3-merous, their pedicels about 3 mm long. Calyx broadly cup-shaped, sparingly pubescent with short hairs externally, about 3 mm long and wide, with three, subequal, very broadly ovate, obtuse lobes about 1.5 mm long. Petals 3, narrowly oblong, 13 mm long, 3.5 mm wide, narrowed more or less at both ends, imbricate, sparingly pubescent externally, apex subacute or obtuse. Stamens 6, united for their lower 1 mm, glabrous, the free parts 8 mm long, quite free from the disk and inserted outside of it; anthers narrowly oblong, 3 mm long. Disk about 2.5 mm long, somewhat tubular or cup-shaped, obscurely lobed, densely hirsute externally with short brown hairs, the apex with much longer, stiff, ciliate hairs.

LEYTE, Dagami, *Phil. Pl. 1168 Ramos*, August, 1912, in forests.

Var. PARVUM var. nov.

A typo differt foliis minoribus, 5 ad 10 cm longis, 2.5 ad 4 cm latis, calycis lobis 3 mm longis.

LEYTE, Dagami, *C. A. Wenzel 103*, June 12, 1913, in forests, a tree about 15 m. high, the flowers white.

The species is well characterized by its hirsute, spreading hairs, its entire, caudate-acuminate (or in the variety merely acuminate) leaves, its racemose, few-flowered racemes, its cylindric, relatively long flowers, and its densely hirsute and hirsute-ciliate disk. The variety proposed differs in its much smaller, somewhat differently shaped, less acuminate leaves, but in all floral characters, except in minor points as to dimensions, which may be due to state of development, it is essentially the same as the species. Additional material will show whether or not the differences are permanent or only trivial.

MELIACEAE

DYSOXYLUM Blume

DYSOXYLUM PLATYPHYLLUM sp. nov. (§ *Eudysoxylum.*)

Arbor 12 m alta, glabra; foliis alternis, 30 ad 40 cm longis, foliolis 5, ovato-ellipticis, chartaceis, in siccitate nitidis, pallidis, usque ad 20 cm longis et 9 cm latis, acuminatis, basi plus minusve inaequilateralibus; paniculis axillaribus multifloris, pyramidatis, circiter 15 cm longis, ramis paucis; floribus 4- vel 5-meris, circiter 9 mm longis, petalis intus minutissime puberulis; tubo libero, extus glabro, intus hirsuto; discus tubulosus, hirsutus; ovario glabro, 4-loculare.

A tree about 12 m high, the trunk 30 cm in diameter, quite glabrous except some parts of the flowers. Branches terete, brownish-gray, somewhat lenticellate, sparingly rugose when dry, somewhat shining. Leaves alternate, 30 to 40 cm long, the rachis somewhat angled. Leaves 5, pale, shining when dry, tough, chartaceous, ovate-elliptic to broadly elliptic, 15 to 20 cm long, 7 to 9 cm wide, the apex prominently and rather abruptly acuminate, the acumen acute or blunt, the base mostly rounded on one side, acute on the other, always distinctly inequilateral; petiolules 5 to 10 mm long; lateral nerves about 10 on each side of the midrib, prominent on the lower surface, brownish, scarcely anastomosing, the reticulations obsolete or nearly so. Panicles in the upper axils, glabrous, solitary, 10 to 15 cm long, pyramidal, the primary branches few, usually 3 or 4, 10 cm long or less. Flowers white, numerous, fragrant, their pedicels 1 to 2 mm long. Calyx broadly cup-shaped, 2.5 mm long or less, usually 4-lobed, the lobes short, broadly ovate, obtuse, sometimes extending one-half to the base of the calyx. Petals 4 or 5, oblong,

about 9 mm long, 2.5 to 3 mm wide, glabrous externally or very minutely puberulent near the apex, inside in the upper part densely and minutely puberulent, quite free from the staminal-tube. Staminal-tube cylindric, 7 to 8 mm long, cylindric, glabrous externally, inside prominently hirsute with long white hairs, apex minutely toothed. Stamens 8 or 10, included, sessile, 1.1 mm long. Disk cylindric, 2 mm high, very densely hirsute. Ovary narrowly ovoid, glabrous, 4-celled, narrowed upward into the 4 to 5 mm long style.

LEYTE, Dagami, *C. A. Wenzel 118*, June 12, 1913, in forests.

Following DeCandolle's arrangement of the species this form falls close to the Malayan *Dysoxylum costulatum* Miq., and *D. nagelianum* C. DC. It is, however, very different from all the species of the section *Eudysoxylum* with free staminal-tubes and glabrous ovaries.

DYSOXYLUM LEYTENSE sp. nov. (§ *Eudysoxylum.*)

Arbor 15 ad 20 m alta, subglabra; foliis ut videtur alternis, usque ad 60 cm longis, 6- vel 7-jugis, foliolis chartaceis vel membranaceis, 15 ad 25 cm longis, oblongo-ellipticis, brevissime obtuse acuminatis; inflorescentiis brevibus, paucifloris, vel brevissime racemosis, e truncis et ramis vetustioribus, solitariis vel fasciculatis; floribus 2.5 cm longis, 4-meris, petalis extus adpresse pubescentibus, tubo libro, glabro, ovario densissime villoso.

A tree 15 to 20 m high, nearly glabrous, or the younger parts slightly pubescent, the flowers prominently so. Leaves apparently alternate, up to 60 cm in length, glabrous or nearly so, with 6 or 7 pair of opposite leaflets; leaflets membranaceous to chartaceous, oblong-elliptic, 15 to 25 cm long, 7 to 12 cm wide, apex very shortly and obtusely acuminate, base more or less inequilateral, somewhat obliquely rounded, very obscurely cordate; petiolules 4 mm long or less; lateral nerves 15 to 18 on each side of the midrib, prominent. Inflorescence from the trunk and larger branches, usually fascicled, of very short, few-flowered racemes, the rachis of the racemes less than 1 cm long. Flowers white, fragrant, 4-merous, their pedicels 7 to 8 mm long. Calyx broadly cylindric or slightly enlarged upward, about 10 mm long, glabrous or with scattered hairs, densely puncticulate, with 4, irregular, oblong to broadly ovate, obtuse, 2 to 3 mm long lobes. Petals 4, strap-shaped, 2.5 cm long, 3 to 4 mm wide, apex thickened, acute or obtuse, externally in the upper one-half rather densely subferruginous-pubescent with short appressed hairs, quite free from the staminal-tube. Staminal-tube cylindric, glabrous outside, inside slightly villous, about 2 cm long, 3.5 to

4 mm in diameter, 3-lobed at the apex, the lobes recurved, narrowly oblong, obtuse or slightly retuse, 2 to 2.5 mm long. Anthers 8, sessile, alternating with the lobes and inserted between them, 1.5 mm long. Disk glabrous, about 3 mm long, truncate, prominent. Ovary very densely villous as is the lower 6 to 8 mm of the style, the upper part of the style glabrous; stigma disk-like, about 1.5 mm in diameter. Fruit yellow or red, globose, glabrous or nearly so, when dry 3 to 3.5 cm in diameter, mostly 3-celled, very tardily dehiscing, the pericarp very thickly coriaceous.

LEYTE, Dagami, *C. A. Wenzel 77* (type), March, 1913, in flower, *Wenzel 10*, June, 1913, *Bur. Sci. 15241 Ramos*, August, 1912, the latter two with fruits.

A very characteristic species, allied manifestly to *Dysoxylum cumingianum* C. DC., D. *cauliflorum* Hiern, *D. ramiflorum* Miq., and *D. caulostachyum* Miq., from all of which it is distinguished by its unusually large flowers.

DYSOXYLUM VERRUCULOSUM sp. nov. (§ *Eudysoxylum.*)

Arbor circiter 25 m alta, plus minusve puberula vel subglabra; foliis ut videtur alternis, circiter 40 cm longis, 6-jugis, foliolis suboppositis, usque ad 13 cm longis, oblong-ellipticis, opacis, chartaceis, in siccitate subolivaceis, utrinque densissime verruculosis, acuminatis, basi inaequilateralibus, nervis utrinque 10 ad 12; paniculis axillaribus, ramosis, circiter 20 cm longis, ramis paucis; floribus numerosis, 4-meris, circiter 8 mm longis, petalis extus dense puberulis, liberis; ovario puberulo.

A tree about 25 m high, more or less puberulent or subglabrous. Leaves apparently alternate, about 40 cm long, the rachis sparingly puberulent; leaflets 6 pairs, subopposite or the lower and upper pair opposite the intermediate ones subalternate, gradually elongated upward, oblong-elliptic, chartaceous, glabrous, up to 13 cm long and 5 cm wide, somewhat falcate, the apex prominently acuminate, the base very inequilateral, when dry very densely verruculose on both surfaces, pale-olivaceous; lateral nerves 10 to 12 on each side of the midrib, distinct on the lower surface, scarcely anastomosing, the reticulations obsolete or nearly so; petiolules about 5 mm long. Panicles apparently axillary, panicled, branched, the branches few, the lowest one up to 10 cm long, the entire panicle up to 20 cm in length, usually with but 3 or 4 primary branches, more or less puberulent, the flowers numerous, flesh-colored, racemosely arranged along the panicle-branches, somewhat fascicled at the

nodes, the pedicles 1 to 2 mm long. Calyx cup-shaped, reddish-brown when dry, glabrous or nearly so, about 3 mm long, eventually split nearly to the base into three, broadly ovate, obtuse segments. Petals 4, oblong, about 8 mm long, 3 mm wide, densely gray-puberulent externally, obtuse, imbricate, quite free from the staminal-tube. Staminal-tube 6 to 7 mm long, cylindric or narrowly ovoid-cylindric, slightly puberulent, the apex with 8, very short, slightly retuse teeth. Stamens 8, the anthers sessile, included, inserted opposite the teeth, oblong-elliptic, about 1 mm long. Disk free, cup-shaped, 2 mm high, slightly pubescent, truncate or very minutely toothed. Ovary ovoid, 1.5 mm long, 4-celled, somewhat pubescent or puberulent, narrowed upward into the stout, slightly puberulent, 4 mm long style; stigma depressed-globose, about 1 mm in diameter.

LEYTE, Dagami, *C. A. Wenzel 28*, May 5, 1913, in forests, altitude about 60 meters.

Apparently belonging in the group with *Dysoxylum arborescens* Miq., as the species are arranged by C. DeCandolle; it is, however, very different from this species and the allied forms, as described. The minutely and densely verruculose leaves is characteristic.

WALSURA Roxburgh

WALSURA BRACHYBOTRYS sp. nov.

Arbor circiter 20 m alta, glabra vel subglabra; foliis alternis, usque ad 20 cm longis, foliolis 3 vel 5, chartaceis, oblongo-ellipticis, utrinque angustatis, apice obtuse acuminatis, basi acutis vel decurrento-acuminatis, majoribus 12 cm longis; inflorescentiis brevissimis, axillaribus, solitariis, pedunculatis, circiter 1 cm longis, parce pubescentibus; floribus circiter 4 mm longis, filamentis retusis.

A tree about 20 m high, nearly glabrous. Branches terete, gray, wrinkled when dry, the growing tips somewhat pubescent. Leaves alternate, up to 20 cm long, glabrous, usually 5-foliolate, with some 3-foliolate ones, or more rarely reduced to 2 or 1 leaflets; leaflets opposite, chartaceous, glabrous, pale-greenish when dry, slightly shining and of nearly the same color on both surfaces, oblong-elliptic, the lower ones smaller than the upper, 6 to 12 cm long, 3 to 4.5 cm wide, about equally narrowed at both ends, the apex prominently acuminate, the acumen usually blunt, the base acute or somewhat decurrent-acuminate; lateral nerves of the larger leaflets about 6 on each side of the midrib, slender, prominent, arched-anastomosing, the reticulations very lax; petiolules about 5 mm long, that of the terminal leaflet twice as long as the lateral ones. Inflorescence very short, about 1

cm long, peduncled, densely flowered, the flowers racemosely arranged, white, their pedicels very stout, 1 to 1.5 mm long, each subtended by two or three, oblong-ovate, acute or acuminate, 1 to 1.3 mm long bracteoles, the inflorescence slightly pubescent. Sepals 5, nearly free, imbricate, orbicular-reniform, rounded, about 1.2 mm long. Petals 5, oblong-elliptic, 3.5 to 4 mm long, 1.8 mm wide, apex obtuse, narrowed below to the subacute base, free. Stamens 10, slightly united at the very base, narrowly oblong, cleft at the apex and bearing a sessile, oblong-ovoid, 0.8 mm long anther at the cleft. Disk obscure, annular, glabrous. Ovary depressed, glabrous; style about 1 mm long.

LEYTE, Dagami, *C. A. Wenzel 295*, July 3, 1913, in forests.

A species entirely different from most of the described ones in the genus, but apparently most closely allied to *Walsura multijuga* King. Its very short dense inflorescences are characteristic.

EUPHORBIACEAE

CHEILOSA Blume

CHEILOSA HOMALIIFOLIA sp. nov.

Arbor dioica, 8 ad 15 m alta, inflorescentiis minute puberulis exceptis glaber; foliis ovatis ad oblongo-ovatis usque ad 20 cm longis, obtusis vel leviter acuminatis, chartaceis vel subcoriaceis, nitidis, margine leviter undulatis, basi rotundatis ad obtusis, eglandulosis, nervis utrinque circiter 8; petiolo 5 ad 7 cm longo; inflorescentiis ♂ axillaribus, anguste paniculatis, usque ad 11 cm longis, floribus parvis, 4- 5- vel 6-meris, circiter 3 mm diametro; inflorescentiis ♀ axillaribus, solitariis, racemosis, floribus 5-, rariter 6-meris, circiter 5 mm longis.

A dioecious tree 8 to 15 m high, glabrous except the somewhat puberulent inflorescence. Branches terete, reddish or olivaceous-brown, smooth. Leaves alternate, ovate to oblong-ovate, firmly chartaceous to subcoriaceous, 14 to 20 cm long, 7 to 11 cm wide, shining, the base rounded to obtuse, without glands at the junction with the petiole, the apex obtuse to somewhat acumunate, margins somewhat undulate or coarsely crenate-undulate, each undulation with a distinct but scarcely projecting gland; lateral nerves usually 8, prominent, curved-ascending, anastomosing, the reticulations slender, distinct; petioles 5 to 7 cm long. Male panicles narrow, slender, many-flowered, axillary, solitary or somewhat fascicled, up to 11 cm long, sparingly puberulent. Flowers 4- to 6-merous, the buds depressed-globose, the pedicels 1.5 to 2 mm long, each subtended by a single, ovate, acuminate, 1 mm long, deciduous bracteole. Sepals 4 to 6, imbricate, ovate,

2 mm long, obtuse or somewhat acute, yellow. Stamens 8, 10, or 12, somewhat 2-seriate, one-half a little longer than the others, the longer filaments 2 mm, the shorter ones 1.3 mm long, subalternate. Rudimentary ovary somewhat pubescent, oblong, about 1 mm long, 2- or 3-cleft. Female inflorescence axillary, solitary or two in each axil, racemose 5 to 10 cm long, slightly puberulent, the pedicels about 5 mm long, each subtended by an oblong-ovate bracteole about 2 mm long. Flowers greenish, 5-, rarely 6-merous, 8 to 12 in each raceme. Sepals 5, rarely 6, oblong, obtuse or acute, slightly pubescent, more or less recurved, about 5 mm long, 2.5 mm wide. Disk annular, prominent. Stamens or staminodes none. Ovary narrowly ovoid, as long as or longer than the sepals, pale, densely gray-pubescent 3-celled, each cell with a single ovule; stigmas 3, rather stout, recurved, 3 mm long, apex slightly notched.

LEYTE, Dagami, *C. A. Wenzel 147*, ♀ flowers (type), *161* ♂ flowers, June 22 and 19, 1913, in forests.

A species quite distinct from *Cheilosa javanica* Bl., but in many respects more closely allied to *Alcinaneanthus philippinensis* Merr., a monotypic genus recently described by me. The leaves have no basal glands as in *Alcinaeanthus*, and the fruit, so far as can be told from old flowers, is evidently 3-locellate. It is decidedly intermediate in characters between *Cheilosa* and *Alcinaeanthus*, and goes far to invalidate the latter genus. In its male flowers being solitary in the axil of each bracteole, not fascicled, it is *Alcinaeanthus*, while in having 4-, 5-, and 6-merous male flowers it is intermediate between the 4-merous *Alcinaeanthus* and 5-merous *Cheilosa*. In its female flowers its 3-celled ovary is a *Cheilosa* character. In vegetative characters it resembles both *Cheilosa* and *Alcinaeanthus*, more the former than the latter because of the entire absence of basal glands. Its specific name is taken from the fact that its leaves very strongly resemble those of several Philippine species of *Homalium*.

TRIGONOSTEMON Blume

TRIGONOSTEMON WENZELII sp. nov. (§ *Eutrigonostemon.*)

Arbor circiter 5 m alta, glabra vel subglabra; foliis breviter petiolatis, late lanceolatis ad elliptico-lanceolatis vel oblanceolatis, integris, usque ad 12 cm longis, glabris, acuminatis, basi obtusis vel acutis, nervis utrinque 7 vel 8; racemis axillaribus, solitariis, paucifloris, quam folia brevioribus vel subaequalibus; floribus ♂ atropurpureis, petalis 5 mm longis, anguste oblongis, staminibus 3.

A small tree, nearly glabrous, the very tips of the branchlets, the younger petioles, and the racemes with few, appressed, more or less deciduous hairs. Branches slender, terete, glabrous. Leaves dark-colored when dry, broadly lanceolate to elliptic-

lanceolate or somewhat oblanceolate, firmly chartaceous, shining, 6 to 12 cm long, 2 to 3.5 cm wide, entire, apex acuminate, base obtuse or somewhat acute; lateral nerves 7 or 8 on each side of the midrib, distinct; petioles mostly about 5 mm long, rarely reaching 1.5 cm in length. Racemes axillary, solitary, slender, few-flowered, shorter than the leaves, sometimes about as long as the smaller leaves, very few-flowered, the flowers distant. Male flowers: Pedicels slender, about 4 mm long, the bracteoles lanceolate, acuminate, about 1.2 mm long. Sepals pink, 5, imbricate, membranaceous, glabrous, narrowly ovate to narrowly elliptic-obovate, obtuse or rounded, 1.5 to 2.5 mm long. Petals very dark-purple, almost black, glabrous, oblong to narrowly oblong-obovate, about 5 mm long, 1.8 mm wide, apex rounded or often deeply and obliquely retuse. Disk-glands 5, prominent, hemispheric, white, 0.5 mm in diameter. United filaments 1.5 mm long; anthers 3, 0.8 mm long. Female flowers borne on the same racemes as the male, fewer, 5-merous their pedicels, just after anthesis, very much thickened, 4 to 5 mm long, 1.5 to 2 mm thick. Sepals unequal, 2 oblong-ovate, 3 mm long, 3 oblong-lanceolate, 4.5 mm long, slightly appressed-pubescent. Ovary sparingly pubescent, 3-celled; styles cleft to the base, the arms 1.8 mm long.

LEYTE, Dagami, *C. A. Wenzel 186*, June 19, 1913, in forests.

A very characteristic species, in vegetative characters somewhat resembling small-leaved forms of *Dimorphocalyx longipes* Merr. The structure of its male flowers is that of typical *Trigonostemon*, however. By the key given by Pax in his recent monograph of this group, it falls next to *Trigonostemon villosus* Hook. f., of the Malay Peninsulata, to which it is not at all closely allied.

GLOCHIDION Forster

GLOCHIDION GLAUCESCENS sp. nov. (§ *Hemiglochidion.*)

Arbor circiter 5 m alta; foliis coriaceis, ovatis ad oblongo-ovatis, usque ad 27 cm longis, 13 cm latis, apice acutis vel obtusis, basi late rotundatis cordatisque, brevissime petiolatis, in siccitate pallidis, subtus glaucescens, utrinque, praesertim subtus, plus minusve hirsutis; floribus axillaribus, fasciculatis, pedicellatis, segmentis 6, ovario hirsuto, columna stylari cylindrica, continua, hirsuta, ovario subaequilonga, leviter angustiore; capsulis subglobosis, circiter 1.4 cm diametro, 8-locellato.

A small tree, about 5 m high. Branches terete, the ultimate branchlets elongated, somewhat compressed or angular when dry, rather densely pubescent. Leaves ovate to oblong-ovate, coriaceous, 20 to 27 cm long, 10 to 13 cm wide, the apex acute or

somewhat obtuse, the base broadly rounded and distinctly cordate, the upper surface pale when dry, with numerous, short, scattered, more or less papillate hairs, the lower surface glaucescent, much paler than the upper, rather uniformly and softly hirsute with spreading, yellowish-brown hairs on the midrib, nerves, and reticulations; lateral nerves 10 to 12 on each side of the midrib, very prominent on the lower surface, the reticulations lax, prominent, subparallel; petioles densely pubescent, stout, 5 mm long or less; stipules linear-lanceolate, acuminate, hirsute, up to 1 cm long. Flowers white, fascicled, few in each fascicle, the staminate and pistillate ones intermixed. Staminate flowers: Pedicels hirsute, 4 to 6 mm long. Perianth campanulate, 5 mm in diameter, the segments 6, oblong-elliptic, about 3 mm long, 1.4 mm wide, somewhat hirsute, subequal, acute or somewhat obtuse, equally narrowed at both ends. Anthers 3, 1 to 1.2 mm long, united, the whole elliptic-oblong. Pistillate flowers: Perianth similar to that of the staminate ones but somewhat shorter, about 2 mm long, more densely hirsute. Ovary broadly ovoid, about 1.2 mm in diameter, hirsute, slightly narrowed at the apex but not contracted, passing into the columnar, densely hirsute, truncate style which is about as long as the ovary, the ovary and style about 2.5 mm long. Capsule subglobose, about 1.4 cm in diameter, sparingly pubescent, about 8-locellate, the pericarp thin, somewhat pink or purplish when dry.

LEYTE, Dagami, *C. A. Wenzel 188*, June 19, 1913, in forests.

A very striking species on account of its unusually large leaves which are pale when dry and prominently glaucescent on the lower surface. Its alliance is with *Glochidion album* (Blanco) Boerl., from which it differs in leaf size, pubescence, color, and in some floral and fruit characters.

AQUIFOLIACEAE

ILEX Linnaeus

ILEX WENZELII sp. nov. (§ *Thyrsoprinus, Indico-Malaicae.*)

Frutex epiphyticus, glaber, circiter 2 m altus; foliis crasse coriaceis, integris, ovatis, usque ad 7 cm longis, apice prominente obtuse acuminatis, basi subrotundatis vel leviter decurrento-acuminatis, in siccitate utrinque nitidis, subtus minutissime dense puncticulatis, nervis primariis utrinque circiter 7, distinctis; inflorescentiis ♀ axillaribus, solitariis, brevissime racemosis vel subfasciculatis, paucifloris, rhachibus circiter 3 mm longis; floribus 4- vel 5-meris, ovario isomero; fructibus globosis, 3.5 ad 4 mm diametro.

An epiphytic glabrous shrub about 2 m high. Branches light-gray or in part reddish-brown when dry, more or less rugose, rather stout, the branchelets slender, reddish-brown. Leaves ovate, entire, thickly coriaceous, 5 to 7 cm long, 3 to 4 cm wide, brownish-olivaceous when dry, of about the same color and strongly shining on both surfaces, smooth, the lower surface densely and minutely puncticulate, the apex prominently acuminate, the acumen up to 1 cm in length, rather broad, blunt, the base broadly rounded or abruptly contracted and slightly decurrent-acuminate; lateral nerves about 7, slender, distinct on the lower surface, anastomosing, irregular, some of the secondary ones nearly as prominent, the reticulations rather lax; petioles 1 to 1.5 cm long. Staminate inflorescences axillary, solitary, densely 4- to 10-flowered, racemose, the rachis about 3 mm long, or subfasciculate, the flowers 4- or 5-merous; pedicels (in fruit) about 2 mm long, the bracteoles subreniform, rounded, 0.5 mm long, 0.7 mm wide. Persistent calyx-lobes orbicular-reniform, margins slightly ciliate, rounded, about 1.5 mm in diameter. Fruit globose, 3.5 to 4 mm in diameter, with 4 or 5 pyrenes.

LEYTE, Dagami, *C. W. Wenzel 99*, June 5, 1913, epiphytic on large trees in forests, altitude about 60 meters.

A species sufficiently well characterized by its very short, densely flowered, pistillate racemes, the rachis but 3 mm long, or the inflorescence so reduced at times as to appear fasciculate.

ELAEOCARPACEAE

ELAEOCARPUS Burmann

ELAEOCARPUS LEYTENSIS sp. nov. (§ *Monocera.*)

Species *E. multifloro* valde affinis, differt foliis paullo majoribus, usque ad 18 cm longis, 8 cm latis, inflorescentiis floribusque minus pubescentibus, petalis bis latioribus, valde ventricosis.

A tree about 20 m high, the trunk 30 cm in diameter, glabrous except the inflorescence. Branches light-brown, terete, somewhat lenticellate. Leaves oblong to oblong-elliptic, subcoriaceous, 15 to 19 cm long, 6 to 8 cm wide, the base obtuse or somewhat rounded, the apex rather broadly acuminate, the margins distantly serrate-glandular, green on both surfaces and shining when dry; lateral nerves about 10 on each side of the midrib, anastomosing, slender but prominent on the lower surface, the reticulations rather lax; petioles glabrous, 4 to 5 cm long. Racemes axillary, solitary, 12 to 14 cm long, slightly appressed-pubescent, in age nearly glabrous, each about 10-flowered, the pedicels slender, 1 to 2 cm long. Flowers white, 5-merous.

Sepals oblong-lanceolate, acuminate, about 8 mm long, 3 mm wide, very slightly pubescent externally, the margins densely puberulent, glabrous inside. Petals as long as the sepals, about 4 mm wide, scarcely narrowed below, strongly ventricose, externally very slightly pubescent, inside very densely villous, the apical 1.5 mm irregularly divided into 3 to 5 unequal teeth or short lobes. Stamens about 18; filaments 1.5 to 2 mm long, glabrous or nearly so; anthers linear-oblong, 4 mm long including the slender, 1 mm long, apical spur on one cell. Torus glands 8, pubescent. Ovary ovoid, glabrous, 4-celled; style glabrous, 6 mm long.

LEYTE, Dagami, *C. A. Wenzel 212*, June 29, 1913, in forests.

A species manifestly very closely allied to *Elaeocarpus multiflorus* (Turcz.) F.-Vill., but differing in so many small characters that it has been considered best to describe it as new. The most prominent distinguishing characters are its less pubescent and broader petals and sepals.

STERCULIACEAE

STERCULIA Linnaeus

STERCULIA DIVARICATA sp. nov. (§ *Eusterculia.*)

Frutex circiter 3 m altus, omnibus partibus plus minusve rubiginoso-stellato-villosus; foliis oblongis ad anguste oblongo-obovatis, simplicibus, usque ad 15 cm longis, acuminatis, integris, basi leviter angustatis, anguste rotundato-cordatulis; stipulis numerosis, lineari-lanceolatis, persistentibus, 1 ad 1.5 cm longis; inflorescentiis circiter 20 cm longis, paucifloris, divaricato-ramosis; floribus ♂ 1 cm longis, lobis liberis; floribus ♀ 1.6 cm longis, lobis leviter cohaerentibus.

A shrub about 3 m high, all or most parts more or less stellate-villous with reddish-brown hairs. Branches terete, grayish-brown slender, glabrous, the ultimate ones about 3 mm in diameter, the branchlets more or less stellate-villous, the internodes elongated, the leaves more or less crowded in distant false verticils. Leaves firmly chartaceous, oblong to narrowly oblong-obovate, 10 to 15 cm long, 3.5 to 6 cm wide, entire, simple, the apex prominently and sharply acuminate, the base gradually narrowed and rather abruptly rounded, slightly cordate, the upper surface shining, rather pale when dry, ultimately quite glabrous except for the somewhat stellate-pubescent midrib, the lower surface distinctly stellate-pubescent with scattered, reddish-brown or ferruginous hairs on the midrib, nerves, and reticulations; lateral nerves about 13 on each side of the midrib, prominent, the reticulations very distinct; petioles densely stellate-villous, 1 to 1.5

cm long; stipules linear-lanceolate, sparingly stellate, acuminate, 1 to 1.5 cm long, numerous, crowded in the upper parts of the pseudo-verticils. Inflorescences in the upper axils, about 20 cm long, stellate-pubescent with reddish-brown or dark-brown hairs, with few, scattered, spreading branches 5 to 6 cm long. Flowers few, yellowish, staminate and perfect ones in the same panicle. Staminate flowers: Calyx brown when dry, stellate-pubescent, about 10 mm long, the lobes oblong, obtuse or subacute, 3 mm wide, 6 mm long, quite free, not at all cohering by their tips. Stamens 10, on a short stalk, the anthers 0.6 mm long, a rudimentary ovary sometimes present. Perfect flowers: Calyx stellate-pubescent, 16 cm long, the tube 8 mm long, villous within, the lobes oblong-lanceolate, cohering by their inarched tips. Ovary on a glabrous 1 mm long stalk, subglobose or ovoid, 2 mm in diameter, usually 3-celled, densely hirsute; style hirsute, about 1 mm long; ovules numerous; stigma broadly 3-lobed, 1.5 mm in diameter.

LEYTE, Dagami, *C. A. Wenzel 93*, March 15, 1913, in forests.

A manifest ally of *Sterculia cuneata* R. Br., *S. stipularis* R. Br., etc., but well characterized by its divaricately branched, few-flowered inflorescence.

MELASTOMATACEAE

MEDINILLA Gaudichaud

MEDINILLA ALBIFLORA sp. nov. (§ *Eumedinilla.*)

Frutex epiphyticus, glaber, 2 m altus; ramis crassis, teretibus, ramulis obscure crasseque 4-alatis vel tantum sulcatis; foliis oppositis, coriaceis, sessilibus, 25 ad 30 cm longis, ovato-ellipticis, basi angustatis, prominente 5-plinerviis; inflorescentiis terminalibus, paniculatis, paniculis brevibus, paucifloris, ebracteatis; floribus 5-meris, albis, petalis circiter 18 mm longis.

An epiphytic shrub about 2 m high, quite glabrous except for the obscurely setose nodes. Branches stout, terete, brown, about 1 cm in diameter, the growing branchlets nearly as thick, very obscurely and thickly 4-winged or merely sulcate. Leaves opposite, sessile, coriaceous, ovate-elliptic, 25 to 30 cm long, 15 to 17 cm wide, rather dull when dry, the lower surface slightly paler than the upper, the apex shortly acuminate, prominently narrowed below, the very base about 3 cm wide, 5-plinerved, the nerves prominent, the interior pair reaching the apex, the exterior pair evanescent at the middle or upper two-thirds, the transverse nervules nearly obsolete on the lower surface, slender but distinct on the upper. Panicles terminal, few-flowered, peduncled, about 12 cm long, without bracts or brac-

teoles. Flowers white, 5-merous, rather large. Calyx somewhat funnel-shaped or distinctly urceolate, truncate, about 6 mm long. Petals obliquely obovate, 18 mm long. Stamens 10, 5 somewhat longer than the others, the longer ones with filaments 11 mm long and anthers 12 mm long, the shorter with filaments about 10 mm long and anthers 9 to 10 mm in length; anthers lanceolate, acuminate, somewhat curved, the longer ones with a very minute dorsal spur, the shorter ones with dorsal spurs nearly 1 mm long. Ovary 5-celled.

LEYTE, Dagami, *C. A. Wenzel 262*, epiphytic in forests, June, 1913.

A species manifestly allied to *Medinilla teysmanni* Miq., from which it differs in its fewer nerved leaves, 5-plinerved, not 9- to 11-plinerved, and its larger flowers. From *M. magnifica* Lindl. it is at once distinguished by its fewer nerved leaves, very much larger flowers, and entire absence of bracts.

MYRSINACEAE

ARDISIA Swartz

ARDISIA LEYTENSIS sp. nov. (§ *Acrardisia.*)

Frutex circiter 2 m altus; foliis subtus glanduloso-punctatis, junioribus inflorescentiisque obscure adpresse lepidotis; foliis oblongo-lanceolatis, usque ad 17 cm longis, acuminatis, basi acutis, nervis utrinque 18 ad 20; paniculis terminalibus, multifloris, circiter 10 cm longis latisque, floribus at apices ramulorum subumbellatim dispositis, sepalis margine ciliatis, acutis, petalis valde punctatis.

A shrub 2 m high or less, except for the scattered, minute, appressed, brown, lepidote scales on the younger branchlets, lower surfaces of younger leaves, and the inflorescence, glabrous. Branches slender, terete or somewhat compresed, brownish-gray, 2 to 3 mm in diameter, more or less flexuous. Leaves oblong-lanceolate, membranaceous or chartaceous, 11 to 17 cm long, 2.5 to 3.5 cm wide, brownish or pale when dry, slightly shining, the apex acute or acuminate, the base acute, prominently pustulate-punctate on the lower surface; lateral nerves 18 to 20 on each side of the midrib, slender, prominent on the lower surface; petioles 5 to 10 mm long. Panicles terminal, slightly brown-lepidote, about 10 cm long and wide, pyramidal, the primary branches few, spreading, the flowers subumbellately arranged at the tips of the secondary or very short tertiary branchlets, 5 to 10 in each umbel. Flowers pink, their pedicels slender, 5 to 6 mm long. Calyx 3 mm in diameter, the lobes spreading, oblong-ovate, acute, 1 mm long, prominently glandular-punctate with dark-colored glands, the margins ciliate-pubescent. Petals oblong,

acute, 3.5 mm long, 2 mm wide, prominently punctate with black and reddish-brown, round and oblong glands. Filaments about 2 mm long, anthers oblong-ovate, very acute, prominently glandular on the back, 2 mm long. Ovary ovoid, glabrous about 1 mm in diameter; ovules 8; style not exserted in bud, in flower 4 mm long. Fruits ovoid, 5 mm long, when dry dark-brown and prominently verruculose-glandular.

LEYTE, Dagami, *C. A. Wenzel* (type), June 5, 1913; *Bur. Sci. 15193 Ramos*, August, 1912, in forests, foothills, altitude about 60 meters.

A very characteristic species manifestly allied to both the Philippine *Ardisia scabrida* Mez, an to the Malayan *A. javanica* A. DC., distinguished readily from both by its differently shaped, much longer, more numerously nerved leaves.

APOCYNACEAE

WILLOUGHBYA Roxburgh

WILLOUGHBYA PAUCIFLORA sp. nov.

Frutex scandens, 5 m altus, inflorescentiis parce puberulis exceptis glaber; foliis oblongis vel oblongo-ovatis, chartaceis, usque ad 15 cm longis, acuminatis, nervis utrinque circiter 12; cymis axillaribus, puberulis, paucifloris, circiter 1 cm longis; corolla urceolata, 6 mm long, intus leviter pubescens.

A woody vine reaching a height of 5 m, quite glabrous except the inflorescence. Branches terete, pale-olivaceous or greenish, the ultimate ones about 3 mm in diameter, sometimes a little compressed at the nodes. Leaves opposite, oblong to oblong-ovate or elliptic-oblong, chartaceus, 10 to 15 cm long, 5 to 7 cm wide, rather pale when dry, of the same color and equally shining on both surfaces, the apex prominently acuminate, the acumen rather abrupt, obtuse, 1 cm long or less, the base rather broadly rounded to somewhat acute; lateral nerves about 12 on each side of the midrib, spreading, slightly ascending, obscurely anastomosing, the reticulations slender, lax; petioles about 5 mm long. Cymes axillary, solitary, few-flowered, about 1 cm long, the bracts ovate-oblong, 1.5 mm long, acute or obtuse, the bracteoles similar but somewhat smaller, the pedicels 1.5 to 2 mm long. Flowers white. Calyx about 2 mm in diameter, the lobes broadly ovate, minutely and sparingly puberulent, the margins minutely ciliate, about 1.5 mm long, rounded. Corolla-tube about 5 mm long, slightly enlarged in the middle, a little contracted at the apex, glabrous outside, slightly pubescent within, the mouth nearly closed, and with two, thick, narrowly oblong, about 1 mm long appendages alternating with each segment, the corolla-lobes overlapping to the left, falcately twisted to the right,

irregular, in general oblong and about 4 mm long, somewhat irregularly lacerate-toothed near the apex. Anthers 5, inserted in the middle of the tube, included, ovate-lanceolate, acuminate, base rounded, about 1 mm long. Ovary 1-celled, narrowly ovoid, glabrous, 1 mm long, tapering into the 1 mm long style; ovules numerous; stigma somewhat lanceolate, about 1 mm long, slightly cleft at the apex. Fruit unknown.

LEYTE, Dagami, *C. A. Wenzel 100*, June 5, 1913, climbing on trees on forested foothills, altitude about 60 meters, the stem less than 1 cm in diameter.

In some respects the floral characters are intermediate between *Willoughbya* and *Chilocarpus;* they approach the former, however, more closely that the latter, and in the absence of fruit the specimen has been described as *Willoughbya.* The second species of the genus for the Philippines.

VERBENACEAE

PREMNA Linnaeus

PREMNA MEMBRANIFOLIA sp. nov.

Frutex scandens, partibus junioribus inflorescentiis exceptis glaber; foliis membranaceis, oblongis, integris, usque ad 10 cm longis, viridibus, nitidis, acute acuminatis, basi rotundatis vel subrotundatis, nervis utrinque circiter 6, adscendentibus; inflorescentiis terminalibus, corymbosis, multifloris, pubescens, circiter 6 cm diametro; calycibus pubescens, bilabiatis, 5-dentatis.

A scandent shrub about 5 m high, the stem 1 cm in diameter, glabrous except the pubescent younger parts and inflorescence. Branchlets terete, brownish, sparingly lenticellate, about 2 mm in diameter. Leaves very thinly membranaceous, oblong, entire, 8 to 10 cm long, 4 to 5 cm wide, when dry green and shining on both surfaces, the apex acutely acuminate, the base rounded or subrounded, the very young ones slightly pubescent on the midrib and nerves, soon becoming glabrous; lateral nerves about 6 on each side of the midrib, slender, distinct, curved-ascending; petioles slender, 2.5 to 4 cm long. Inflorescence terminal, corymbose, rather densely subcinereous-pubescent with very short hairs, about 6 cm long and wide, many-flowered. Flowers white, the pedicels 1 to 3 mm long. Calyx pubescent, somewhat ovoid or long cup-shaped, distinctly 2-lipped, one lip 2-toothed, the other 3-toothed, the teeth of the former considerably smaller than those of the latter. Corolla, including the lobes, about 6 mm long, glabrous outside, the tube villous within, 2-lipped, one lip with two lobes about 2 mm long and wide, slightly retuse, the other distinctly longer and much broader, with a central, suborbicular,

lobe 2 mm in diameter and two lateral lobes about 1.5 mm long and distinctly narrower than the middle lobe. Style 6 mm long.

LEYTE, Jaro, *C. A. Wenzel 114*, June 8, 1913, climbing on trees in forests.

In general appearance more like *Premna subscandens* Merr. than any other Philippine species, but quite different in many characters, such as its thinner leaves which are ultimately quite glabrous, rounded and not cordate at the base, oblong, etc., its more lax inflorescence, and much less dense pubescence.

GESNERIACEAE.

CYRTANDRA Forster

CYRTANDRA FUSCONERVIA sp. nov. (§ *Decurrentes.*)

Planta erecta, non ramosa, 0.5 m alta, subtus foliis ad nervos ramulis inflorescentiisque prominente fusco-pilosis; foliis usque ad 23 cm longis, in paribus aequalibus, oblongo-obovatis, breviter acuminatis, basi longe angustatis, sessilibus, in siccitate supra olivaceis vel brunneo-olivaceis, subtus pallidis, nervis reticulisque brunneis; inflorescentiis breviter pedunculatis, paucifloris, 2-bracteatis, bracteis ovato-lanceolatis, navicularibus, acuminatis, 2.5 cm longis; floribus anguste campanulatis, 4.5 cm longis.

An erect, apparently unbranched plant about 0.5 m high, more or less pilose with long, appressed, dark-brown hairs. Younger parts of the stem, the lower surfaces of the leaves on the midrib, nerves, and reticulations, and the inflorescences dark-brown pubescent, the upper part of the stem about 5 mm in diameter. Leaves opposite, sessile, in equal pairs, oblong-obovate, firmly chartaceous to subcoriaceous, 15 to 20 cm long, 7 to 9 cm wide, the apex shortly and abruptly apiculate, the base long narrowed and subspatulate, the basal 3 to 5 cm rarely over 1 cm wide, the margins subregularly and rather prominently toothed except in the basal part, the upper surface with few scattered hairs, in age glabrescent, when dry olivaceous or brownish-olivaceous, dull, the lower surface pale, in strong contrast to the dark-brown midrib, prominent nerves, and lax reticulations, the midrib, nerves and reticulations brown-pilose, the surface otherwise nearly glabrous or with only scattered hairs. Inflorescence axillary, solitary, short-peduncled, all parts more or less appressed-pilose, the peduncles 5 mm long or less, densely brown-pubescent, bearing at the apex two, large, boat-shaped, ovate-lanceolate, long-acuminate, 2.5 cm long, densely brown-pubescent bracts. Flowers white, few, usually 3 to 5 in each inflorescence, subsessile or shortly pedicelled. Calyx about 2 cm long, with long, appressed, rather scattered, brown hairs externally, the lobes lanceolate-ovate, acuminate. Corolla narrowly campanulate,

about 4.5 cm long, prominently appressed-pilose, the hairs rather pale.

LEYTE, Dagami, *C. A. Wenzel, 88*, March 31, 1913, in forested foothills, altitude about 60 mm.

A species in the same group with *Cyrtandra chiritioides* Kränzl., *C. glaucescens* Kränzl., *C. humilis* Elm., and *C. attenuata* Elm., differing from all in its much broader leaves and in its larger flowers.

RUBIACEAE.

HYDNOPHYTUM Jack

HYDNOPHYTUM LEYTENSE sp. nov.

Frutex epiphyticus, glaber, circiter 0.8 m altus; ramis in siccitate rubro-brunneis, rugosis, 2 ad 5 mm diametro; foliis nitidis, coriaceis, oblongis ad anguste oblongo-ellipticis, obtusis, basi acutis, 4 ad 10 cm longis, in siccitate pallide olivaceis vel pallide viridibus, vix brunneis, nervis utrinque circiter 8, obscuris; floribus axillaribus, fasciculatis, 4 mm longis; pyrenis solitariis, oblongo-ellipsoideis, acutis, 3.5 mm longis.

An epiphytic shrub about 80 cm high, quite glabrous. Branches dark reddish-brown, much wrinkled when dry, 2 to 5 mm in diameter, somewhat shining, the internodes 2 to 5 cm long, those of the branchlets 1 to 2 cm in length. Leaves coriaceous, oblong to narrowly oblong-elliptic, 4 to 10 cm long, 1 to 3 cm wide, obtuse, base acute, margins distinctly recurved, when dry of about the same color and shining on both surfaces, pale-greenish or pale-olivaceous, scarcely brownish, the midrib prominent; lateral nerves about 9 on each side of the midrib, slender, ascending, indistinct, the reticulations obsolete; petioles stout, 1 to 2 mm long. Flowers axillary, fascicled, white, sessile, 2 or 3 to 10 or more in a fascicle, but one or two opening at one time, 4 mm long. Calyx 2 to 2.3 mm long, somewhat funnel-shaped or cup-shaped, the limb much produced, truncate. Corolla 3 mm long, cleft one-half to the base into 4, oblong, obtuse, 1.5 mm long lobes which are thickened at the apex inside, the throat villous. Anthers subsessile, 0.8 mm long. Fruit red, fleshy, narrowly ovoid, 5 mm long, the calyx-limb deciduous, each normally with but a single pyrene which is oblong-ellipsoid, acute, 3.5 mm long.

LEYTE, Ormoc-Binahaan, *C. A. Wenzel 45*, April 28, 1913, usually growing on large vines in forested foothills, altitude about 200 meters.

A species manifestly allied to *Hydnophytum formicarium* Jack, but differing in its somewhat more numerously nerved, relatively narrower leaves which do not turn brown in drying, and in its much smaller flowers; the flowers of *Hydnophytum formicarium* are described as one-fourth of an inch in length.

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ASCOMYCETES PHILIPPINENSES, III

By H. REHM

(*Munich, Germany*)

PERISPORIACEAE

MELIOLA Fries

MELIOLA SANDORICI Rehm sp. nov.

Mycelium plagulas epiphyllas, velutinas, orbiculares, nigritulas, dispersas, 2-4 mm latas formans. Hyphae centrifugae, ramosae, fuscae, -8 μ lat., hyphopodiis capitatis alternantibus, oblongo-clavatis, crebris, 2-cellularibus, 12 x 6-8 μ, hyphopodiis mucronatis 15 x 7-8 μ obsessae. Setae nullae. Perithecia in centro mycelii sparsa, globulosa, astoma, -150 μ, atra. Asci 2-spori 30 x 20 μ. Sporae oblongae, utrinque rotundatae, 4-septatae, flavo-fuscae, subconstrictae, 30 x 10-12 μ.

LUZON, Prov. Laguna, Los Baños, *Baker 743*, Jan., 1913. Ad folia *Sandorici indici*.

Weicht von *Meliola Usteriana* Rehm Ascom. exs. 1875 durch gestreckte Hyphen und eingeschnürte Sporen ab.

MELIOLA SIDAE Rehm sp. nov.[1]

Mycelium plagulas arachnoideas, orbiculares, tenuissimas, nigrescentes, discretas, 1-3 mm latas, raro confluentes, epiphyllas, in hypophyllo interdum crustaceas formans. Hyphae centrifugae, subramosae, fuscae, 6-7 μ crassae, hyphopodiis capitatis plerumque alternantibus, 2-cellularibus, apice ovoideis, interdum truncatis vel sublobulatis, 12-15 x 10-12 μ, hyphopodiis mucronatis plurimis oppositis 15 x 6-9 μ obsessae. Perithecia dispersa, globulosa, astoma, atra, verruculosa, 120 μ lata, ad basim setis singulis erectis, apice acutatis, septatis, obscure fuscis, -200 x 7-8 μ, aliis erectis apice obtusis et dilutioribus, septatis, 60-100 x 7-8 μ instructa. Asci elliptici, 30 x 15 μ, 4-spori. Sporae oblongae,

[1] This species was previously reported, supra, page 181, as *Meliola microspora* Pat. et Gaill, from the same specimens.

utrinque rotundatae, 4-septatae, ad septa subconstrictae, flavo-fuscae, 25-27 x 9-10 μ.

LUZON, Prov. Laguna, Los Baños, *Baker 117*, Oct., 1912. Ad folia *Sidae javensis*.

Durch die 2 verschieden geformten und gefärbten Setae von *M. microspora* Pat. et Gaill. verschieden.

MELIOLA INSIGNIS Gaill. in Bull. Soc. Myc. Fr. 44: t. 6, f. 1.

LUZON, Prov. Laguna, Los Baños, *Baker 905a*, Apr., 1913. Ad folia *Malloti philippensis*.

Stimmt mit den aufrecht stehenden Hyphen–Büscheln und den characteristischen Conidien genau zur Beschreibung, leider fehlen Perithecien. *No. 905b* auf den gleichen Blättern zeigt ebenfalls Conidien, denen der *Meliola penicilliformis* Gaill l. c. 51 entsprechend.

MELIOLA MAESAE Rehm sp. nov.

Mycelium hypophyllum, plagas velutinas, orbiculares, atras, 0.5-2 cm lat, late arachnoidee marginatas formans. Hyphae myceliales ramosae, subcurvatae, fuscae, 7-9 μ lat., hyphopodiis capitatis 2-cellularibus, ovoideo-elongatis, rectis vel subcurvatis, 15 x 7-8 μ, alternantibus vel oppositis, hyphopodiis mucronatis oppositis raris 15 x 6 μ obsessa. Setae myceliales ad basim curvatae, erectae, apice acutatae, obscure fuscae, circ. 250 x 8-9 μ. Perithecia globulosa, astoma, haud verrucosa, in centro mycelii dispersa, circ. 150 μ. Asci ovoidei, bispori, 30 x 20 μ. Sporae oblongae, utrinque obtusae, 5-cellulares, haud constrictae, flavo-fuscae, 20 x 9-10 μ.

LUZON, Prov. Laguna, Los Baños, *Baker 699, 718*, Jan., 1913. Ad folia et ramos vivos *Maesae laxae*.

Steht der *Meliola Telosmae* Rehm nahe, unterscheidet sich aber durch wellige Hyphen und ganz verschiedene Hyphopodien.

MELIOLA SAKAWENSIS P. Henn in Hedwigia (1904) 141. Cfr. Sacc. Syll. 17: 548.

LUZON, Prov. Laguna, Los Baños, *Baker 741*, Jan., 1913. Ad folia *Clerodendron intermedium*.

MELIOLA TELOSMAE Rehm sp. nov.

Mycelium plerumque epiphyllum, plagas velutinas, atras, orbiculares, 0.5-2 mm latis, demum plus minusve late confluentes formans. Hyphae rectae, sparse acutanguliter ramosae, fuscae, 5-7 μ cr., hyphopodiis capitatis plurimis, elongato-ovoideis, 2-cellularibus, alternantibus vel oppositis, -18 x 5-6 μ, hyphopodiis mucronatis plerumque oppositis, -20 x 6-8 μ obsessae. Setae myceliales erectae, ad basim subcurvatae, apice acutatae, fusconigrae, crebrae, -250 x 5-7 μ. Perithecia in medio mycelii pauca aggregata, globulosa, haud rugosa, astoma, atra, -150 μ. Asci

ovato, 2-4-spori, 40-45 x 25 μ. Sporae oblongae, utrinque rotundatae, 4-septatae, haud constrictae, olivaceo-fuscae, 25-30 x 10-12 μ.

LUZON, Prov. Laguna, Los Baños, *Baker 777*, Jan., 1913. Ad folia *Telosmae procumbens.*

Steht *M. microspora* Pat. et Gaill. nahe, verschieden aber durch scharf zugespitzte, bis an die Spitze dunkelbraune Setae.

MELIOLA STENOSPORA Winter in Hedwigia (1886) 97. Cfr. Gaillard, Meliola 86.

LUZON, Prov. Laguna, Los Baños, *Baker 770*, Jan., 1913. Ad folia *Piperis.*

Exemplaria ad folia *Alstoniae scholariae, Baker 744,* nimis macra, verisimiliter non huc pertinent. Itemque ad folia *Ehretiae navesii, Baker 94,* potius ad *Meliolam cylindrophoram* Rehm pertinentia.

MELIOLA HORRIDA Rehm sp. nov.

Mycelium amphigenum, plagulas orbiculares, arcte marginatas, subcrustaceas, nigras, hirsutas, 4-5 mm latas, dispersas formans. Hyphae acutangulariter ramosae, rectae, arcte congregatae, -8 μ cr., hyphopodiis capitatis plurimis, oppositis, fere adjacentibus, 2-cellularibus, brevissime stipitatis, cellula globoso-ovoidea superiore -14 x 8 μ, hyphopodiis mucronatis rarissimis, alternantibus, -18 μ long, obsessa. Setae myceliales plurimae, erectae, subacutatae, nigro-fuscae, -400 x, ad basim, 12 μ cr. Perithecia dispersa, globosa, non verruculosa, astoma, atra, 200 μ. Asci elliptici, 2-spori 50 x 30 μ. Sporae oblongae, utrinque rotundatae, subconstrictae, 28 x 18 μ, flavo-fuscae.

LUZON, Prov. Laguna, Los Baños, *Baker 976*, April, 1913. Ad folia coriacea.

Durch die dicht gedrängten, langen, dunklen Setae und die Form und Stellung der Hyphopodien ausgezeichnet, dadurch und durch kleinere Sporen von *Meliola praetervisa* Gaill. sehr verschieden.

MICROTHYRIACEAE

MYIOCOPRON Spegazzini

MYIOCOPRON BAKERIANUM Rehm sp. nov.

Perithecia scutato-dimidiata, orbicularia, convexula, distincte minute papillulata poroque pertusa, nigra, 0.25-0.3 mm lat., singularia, mox in maculas nigritulas late effusas confluentia, parenchymatice fusce contexta, ad marginem hyphis paucis fuscidulis radiantibus. Asci clavati, apice rotundati, sessiles, 50 x 10-12 μ, 8-spori. Sporae ellipsoideae, rectae, 1-cellulares, non guttatae, hyalinae, 12-15 x 5 μ, distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *Baker 40a*, Sept., 1912. Ad ramos putrescentes *Passiflorae quadrangularis.*

Bildet schwärzliche Überzüge, unterscheidet sich von den beschriebenen Arten besonders durch keulige, nicht ovale Schläuche und elliptische Sporen; von dem sehr nahe stehenden *M. millepunctatum* Penz. et Sacc. Syll 14: 687 durch deutliche Papille.

MICROTHYRIUM Desmazières

MICROTHYRIUM (plane inevolutum).

LUZON, Prov. Laguna, Los Baños, *Baker 721*, Jan., 1913. In pagina superiore foliorum *Evonymi javanicae*.

MICROPELTIS Montagne

MICROPELTIS CONSIMILIS Rehm sp. nov.

Perithecia in utraque foliorum pagina immutata dispersa, sessilia, orbicularia, dimidiato-scutata, poro pertusa, glabra, atroviolacea, arcte reticulate contexta, haud radiata, 0.2 mm diam. Asci elongato-ovoidei, sessiles, -70 x 12 μ, 8-spori. Sporae clavatae, apice superiore obtuso, inferiore acutato, rectae, transverse plerumque 3-, interdum 4-septatae, cellula suprema plerumque majore, hyalinae, -25 x 5-6 μ, distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *Baker 882*, March, 1913. Ad folia *Derris*.

Proximae videntur *M. distincta* Henn. et *M. aequalis* Sydow.

MICROPELTIS APPLANATA Montagne Syll. Gen. Cr. (1856) 249.

LUZON, Prov. Laguna, Los Baños, *Baker 1025*, April, 1913. Ad folia *Roureae erectae*.

Perithecia in hypophyllo sessilia.

Die Beschreibung v. Höhnels Ber. Kais. Ak. Wiss. Wien 119 [1]: 407, Fragm. Myc. 10: 15 stimmt sehr gut, nur sind die keuligen Sporen lang 5-zellig mit grösster oberer Zelle, die sich später manchmal querteilt, ebenso in einem Exemplar meiner Sammlung auf Blättern von *Casearia silvestris* aus Argentinien, leg. Lorenz.

MICROPELTIS VAGABUNDA Speg. F. Guar. nonn. nov. 126 p. 44.

Var. **CALAMINCOLA** Rehm var. nov.

Perithecia in foliis haud maculatis dispersa, amphigena, dimidiato-scutata, nigra, poro centrali pertusa, convexula, faciliter ab epidermio soluta, glabra, 0.3 mm diam., intricato violacee contexta, integre marginata. Asci fusiformes, sessiles, 50-60 x 10-12 μ, 8-spori. Sporae fusiformes, utrinque acutatae, rectae, 3-septatae, non constrictae, hyalinae, 15 x 3-3.5 μ 2-3-stichae. Paraphyses filiformes.

LUZON, Prov. Laguna, Los Baños, *Baker 906*, April, 1913. Ad folia ? *Calami*.

Stimmt im Ganzen so gut zu *M. vagabunda* (Sacc. Syll. 11:382), dass der Pilz dahin zu stellen ist.

CAPNODIACEAE

LIMACINULA Saccardo

LIMACINULA MALLOTI Rehm sp. nov.

Mycelium tabacino-fuscum totam superiorem foliorum paginam obducens, faciliter secedens, membranaceum cellulis fuscidulis, 10-14 μ lg. 6-7 μ lat., arcte seriatis contextum, glabrum; in eaque perithecia aequaliter membranacea contexta perithecia, plus minusve gregaria, globulosa, glabra, atra, poro minutissimo aperta, 0.2 mm lat., sicca apice collabentia. Asci ovales, 50 x 20-25 μ, 8-spori. Sporae oblongae, utrinque obtusae, transverse 3-5, longitudinaliter semel septatae, hyalinae, 20-24 x 10-12 μ, distichae. **Paraphyses nullae.**

LUZON, Prov. Laguna, Los Baños, *Baker 878*, March, 1913. Ad folia *Malloti philippensis.*

Stimmt zu *Limacinula* Sacc Syll. 17: 558 und steht jedenfalls in nächtster Verwandtschaft zu *Limacinula javanica* Zimmermann, Centralbl. Bakt. 8 (1902) 151 sub *Capnodium*, Sacc. l. c., nur verschieden durch kleinere Sporen.

NECTRIACEAE

LISEA Saccardo

LISEA SPATHOLOBI Rehm sp. nov.

Perithecia in maculis folii hypophyllis plus minusve orbicularibus, 1-2.5 cm lat., dilute flavescentibus gregarie sessilia, globoso-conoidea, haud papillulata, poro pertusa, fusca, 150 μ diam., excipulo crasso, parenchymatice contexto, cellulis faciliter dissolutis; extus obscure fusco, interius coerulescente, versus basim verrucoso cellulis conoideo prominentibus. Asci fusiformes, 30 x 8-10 μ, 8-spori. Sporae oblongae, utrinque obtusae, rectae vel subcurvatae, 1-cellulares biguttatae, dein medio septatae, non constrictae, utrinque 2-guttatae, hyalinae, 10-12 x 3-4 μ, distichae. **Paraphyses nullae.**

LUZON, Prov. Laguna, Mount Maquiling, *E. B. Copeland* comm. *Baker 776*, Jan., 1913. **Ad folia *Spatholobi gyrocarpi.***

Ein nachweisbares Mycel, auf dem die Perithecien sitzen, ist nicht vorhanden. Durch die weiche Beschaffenheit des leicht zerfallenden dicken Gehäuses gehört der Pilz zu den Hypocreaceen und hier zu *Lisea.*

DOTHIDEACEAE

AUERSWALDIA Saccardo

AUERSWALDIA DECIPIENS Rehm sp. nov. (*Phaeochora*, v. Höhnel Fragm. Myc. 9: 53).

Stromata peridermio innata, intus carbonacea, primitus dispersa, dein plus minusve confluentia, hemiglobose prominentia,

atra, nitentia, 1-2.5 mm diam., loculi peritheciales 2-4 innata, globulosa, 0.5 mm diam., papillulis minimis conoideis prominentibus. Asci cylindracei, 80-100 x 12 μ, 8-spori. Sporae ellipsoidae, 1-cellulares, rectae, fuscae, 12-14 x 7-8 μ, oblique, 1-stichae. Paraphyses septatae, 3-4 μ crassae.

LUZON, Prov. Laguna, Los Baños, *Baker 706*, Jan., 1913. Ad petiolos emortuos *Arengae*.

Von *Auerswaldia Arengae* (Rac.) Sacc. et Syd. durch das nur im Perderm eingewachsene Stroma, wonach der Pilz zu *Phaeochora* von Höhnel gehört und durch die Form der Sporen ganz verschieden.

PHYLLACHORA Nitschke

PHYLLACHORA LAGUNAE Rehm sp. nov.

Stromata in maculis suborbicularibus, late extensis, flavide luteolis, vix obscurius marginatis folio gregarie innata, atra, in utraque pagina conspicua, in epiphyllo hemisphaerice prominentia, orbicularia, rarius confluentia, 0.3-0.5 mm diam., loculos 1-4 minimos includentia. Loculi interdum subpapillulati, poro pertusi. Asci cylindraceo-clavati, sessiles, -60 x 8-10 μ, 8-spori. Sporae oblongae, utrinque rotundatae, rectae, 1-cellulares, interdum biguttatae, hyalinae, 7 x 4 μ, 1-2-stichae. Paraphyses filiformes, subgelatinosae.

LUZON, Prov. Laguna, Los Baños, *Baker 959*, April, 1913. Ad folia *Derris ellipticae*.

Durch die winzigen, nur wenige Loculi enthaltenden Stromata und die kleinen Sporen sehr auffällig.

PHYLLACHORA PARKIAE P. Henn. in Hedwigia 47: 255.

LUZON, Prov. Laguna, Los Baños, *Baker 758*, Jan., 1913. Ad folia *Parkiae timorianae* (*P. roxburghii*).

PHYLLACHORA CYNODONTIS Niessl. Notiz. Pyren. 54. *Phyllachora graminis* (Pers.) Fuckel, f. *Cynodontis Dactyli* Sacc. Syll. 2: 602.

LUZON, Prov. Laguna, Los Baños, *Baker 756, 821*, Jan., 1913. Ad folia *Cynodontis Dactyli*.

PHYLLACHORA CANARII P. Henn. in Hedwigia 47: 254; Sydow in Leafl. Philip. Bot. 4: 1156.

LUZON, Prov. Laguna, Los Baños, *E. D. Merrill*, comm. *Baker 870*, March, 1913. Ad folia *Canarii villosi*.

PHYLLACHORA (ENDOPHYLLACHORA) PSEUDES Rehm sp. nov.

Stromata gregaria, folio plane innata, utrinque dilute flavidule tecta, paginum superiorem folii protuberantia ibique papillulis conoideis nigrescentibus prominentibus conspicua, atra, subglobosa, circ. 1 mm. diam., loculos 3–5 includentia, demum elapsa lacunulam in folii parenchymate relinquentia. Asci cla-

vati, 60 x 15 μ, 8-spori. Sporae oblongae, utrinque rotundatae, 1-cellulares, haud guttatae, hyalinae, 10–12 x 6–9 μ distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *Baker 914*, April, 1913. Ad folia *Fici notae.*

Macht durch die völlig im Blatt-Parenchym entwickelten Stromata und den einzeln hervortretenden Papillen den Eindruck von *Phomatospora.* Allein es sind deutliche, mehrere Loculi enthaltende Stromata, die in der Reife aus dem abgestorbenden Blatt herausfallen. Ähnlich scheint *Phomatospora elastica* Zimmerm. (Cfr. Sacc. Syll. 17: 578), an *Ficus elastica,* doch sind Schläuche und Sporen in Grösse wesentlich verschieden. Durch die nur im Blattparenchym erfolgende Entwicklung der Stromata lässt sich **ENDOPHYLLACHORA** Rehm n. gen. begründen.

PHYLLACHORA LUZONENSIS P. Henn in Hedwigia 17: 255.

LUZON, Prov. Laguna, Los Baños, *Baker 979,* April, 1913. Ad folia *Milletiae cavitensis.*

PHYLLACHORA SPINIFERA (Karst. et Har.) v. Höhnel. *Phyllachora Ficium* Niesse. in Hedwigia (1881) 99, var. *spinifera* Karst. et Har. Rev. Myc. (1890). Cfr. Sacc. Syll. 9: 1014.

LUZON, Prov. Laguna, Los Baños, *Baker 701,* Jan., 1913. Ad *Ficus* sp.

Mein Original-Exemplar befindet sich auf *Ficus Ridelii* aus S. Afrika, und unterscheidet sich von *P. Ficium* durch Stroma und Sporen vollständig.

PHYLLACHORA PTEROCARPI Rehm sp. nov.

Stromata in maculis epiphyllis orbicularibus, flavidulis, 2–3 cm lat. innata, demum et in hypophyllo exarato brunneo prominentia, atra, circulatim aggregata, angulosa, 0.5–2 mm lat., 3–7 loculos includentia. Loculi peritheciales globulosi, 0.15–0.2 mm lat. Asci clavati, sessiles, 60 x 15–18 μ, 8-spori. Sporae oblongae, utrinque rotundatae, 1-cellulares, haud guttatae, hyalinae, 15–18 x 7–8 μ, strato mucoso tenui obductae, distichae. Paraphyses filiformes.

LUZON, Prov. Laguna, Mount Maquiling, *E. B. Copeland* comm. *Baker 780,* Jan., 1913. Ad folia *Pterocarpi.*

Durch die Sporen von *Dothidea Pterocarpi* Syd. jedenfalls ganz verschieden.

PHYLLACHORA ? CIRCINATA Sydow in Ann. Myc. 7: 38.

LUZON, Prov. Laguna, Los Baños, *Baker 933,* April, 1913. Ad folia *Fici odorati.*

Differt modo sporis 2-guttatis, subminoribus.

PHYLLACHORA ELMERI Sydow in Leafl. Philip. Bot. 4: 1157.

LUZON, Prov. Laguna, Los Baños, *Baker 913, 1024,* April, 1913. Ad folia *Fici ulmifoliae.*

Differt a descriptione modo sporis biguttatis.

PHYLLACHORA VALSIFORMIS Rehm sp. nov.

Stromata in maculis dilutissime flavidulis hypophyllis in epiphyllo vix conspicius adnata, singularia, dein 3–10 gregaria, orbicularia, atra, nonnulla demum in maculis atramentose nigris, interdum circularibus confluentia, 1.5–2.5 mm lata, in eorumque centro convexo, demum dilute albidulo, late nigre marginato papillulis loculorum 2–5 innatorum protuberantibus obsessa. Asci clavati, -60 x 15 μ, 8-spori. Sporae oblongae, rectae, utrinque obtusae, 1-cellulares, biguttatae, hyalinae, 12 x 6 μ, distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *Baker 958a*, April, 1913. Ad folia *Fici crassitorae.*

Valsaartig eng beisammen stehend und eng gedrängt mit kleinen Papillen vortretend finden sich breit umrandet vom Stroma die Loculi. Nahe verwandt ist *Phyllachora circinata* mit epiphyllem, obige mit hypophyllem Stroma.

DOTHIDELLA Spegazzani

DOTHIDELLA CANARII Rehm sp. nov.

Stromata in maculis flavidulis folio innata in utraque pagina conspicua, dispersa, orbicularia, plana, atra, c. 3 cm lata, verruculosa loculis plurimis globulosis. Asci clavati, 80 x 10 μ, 8-spori. Sporae fusiformes, utrinque acutatae, medio septatae, non constrictae, hyalinae, 12–15 x 3–4 μ, distichae.

LUZON, Prov. Laguna, Los Baños, *Baker 779*, Jan., 1913. In foliis *Canarii villosi.*

Von *Physalospora Canarii* P. Henn in Hedwigia 17: 254 durch 2-zellige zugespitzte Sporen ganz verschieden.

SPHAERIACEAE

ANTHOSTOMELLA Saccardo

ANTHOSTOMELLA MINDORENSIS Rehm sp. nov.

Perithecia maculis corticis ellipsoidiis, -1 cm lg. 3–4 mm lat., demum confluentibus, nigro-fuscis gregarie innata, conoidea, minute papillulata, atra, glabra, subcoriacea, 0.2 mm lat. Asci cylindracei, apice rotundati, 100 x 10 μ, 8-spori. Porus intus 2 I+. Sporae oblongae, utrinque obtuse, fuscae, 1-cellulares, haud guttatae, strato mucoso tenuis obductae, 12–15 x 7–9 μ, 1-stichae. Paraphyses filiformes.

LUZON, Prov. Laguna, Los Baños, *E. B. Copeland*, comm. *Baker 900* (etiam. *860 c.* p. p.) April, 1913. Ad rhachidem emortuam *Arengae mindorensis.*

Steht der *Anthostomella contaminans* Dur. et Mtg. sub *Sphaeria* Sacc. Syll. 1: 280 sehr nahe.

ANTHOSTOMELLA DONACINA Rehm sp. nov.

Perithecia in maculis nitritulis, suborbicularibus, 1–2 cm lat., raro deficientibus gregarie innata, dein prorumpentia, primitus areola nigra minima tecta, globosa, minutissime papillulato, poro perspicuo pertusa, 0.3 mm lat., excipulo parenchymatice fusce contexto. Asci cylindracei, 40–50 x 4–5 μ, 8-spori, I—. Sporae oblongae, utrinque rotundatae, rectae, 1-cellulares, non guttatae, fuscidule, 7–8 x 2–2.5 μ, 1-stichae. Paraphyses non conspicuae.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo* comm. *Baker 1016*, April, 1913. Ad emortuum *Donacem cannaeformem.*

Gehört zur Gruppe der Monocotyledonen bewohnenden *Anthostomella phaeosticta* (Berk.) Sacc. durch mehr weniger eingewachsene Perithecien und kleine Sporen ausgezeichnet. Sehr nahe steht *Anthostomella minor* Ell. et Ev. in Journ. Myc. (1887) 43 in petiolis *Sabal.*

APIOSPORA Saccardo

APIOSPORA CURVISPORA (Speg.) Rehm. *Scirrhiella curvispora* **Speg. Fungi Guar. I no. 258.**

Var. ROTTBOELLIAE Rehm, var. nov.

Stromata 0.5-1 (interdum confluentia -2) cm longa. Perithecia confluentia, monosticha, conspicue minute papillulata. Asci subfusiformiter clavati, sessiles, c. 100 x -18 μ, 8-spori. Sporae oblongo-clavatae, apice superiore obtuso latiore, inferiore angustato, 35-40 x 7-10 μ, in parte tertia subcurvatae, ibique 3-5 μ supra basim transverse septatae, non constrictae, hyalinae, distichae. Parapyses filiformes, 4-5 μ lat., septatae, guttulataeque.

LUZON, Prov. Laguna, Los Baños, *Baker 917*, April, 1913. Ad culmos emortuos *Rottboelliae exaltatae.*

Differt a *Sc. curvispora* modo papillodis exacte conspicius, spori non guttulatis, ab *Ap. luzonensis* P. Henn. sporis majoribus, non constrictis vix diversa. Simillima etiam videtur *Ap. camptospora* Penz. et Sacc. in Malpighia 11 (1897) 398, modo "ascis cylindraceis crassetunicatis" diversa, in foliis *Sacchari officinarum*, Java.

APIOSPORELLA

APIOSPORELLA CORYPHAE Rehm sp. nov.

In mycelio tenuissime et latissime effuso, cortici arcte adhaerente, fuscidulo, parenchymatice dilute fuscidule contexto, algarum cellulis carente perithecia in plagulis suborbicularibus nigritulis gregarie plurima consociata, globulosa, 0.15 mm lat., apice subhyalina, excipulo parenchymatice fusce contexto, tenuissimo. Asci ellipsoideo-clavati, sessiles, teneri, 35-40 x 10-12 μ, 8-spori. Sporae clavatae, rectae, infra medium septatae, non

constrictae, hyalinae, cellula superiore 12-5 μ, inferiore 4-5 μ long., distichae. Paraphyses nullae.

LUZON, Prov. Laguna, Los Baños, *Baker 769*, Jan., 1913. Ad petiolos emortuos *Coryphae elatae.*

Ob der wunderchön entwickelte, äusserst zart gebaute Pyrenomycet seine richtige Stellung hier hat, lasse ich dahin gestellt.

HYPOXYLON Bullard

HYPOXYLON (SPHAEROXYLON) CORYPHAE Rehm sp. nov.

Stromata singularia vel 6-8 gregaria, hemigloboso conoidea vel placentiformiter convexa, lata basi sessilia, 1-2.5 mm diam., 1-8 mm alta, atra, primitus tenuissime rubre granulata, carbonacea, intus fusco-rubra, fibroso compacta, extus papillulis minimis, vix conspicuis. Perithecia monosticha, globulosa, 0.2 mm diam. Asci clavati, longestipitati, p. sporf. 25 x 5-8 μ, 8-spori. Sporae ellipsoideae, 1-cellulares, biguttatae, hyalinae, dein subfuscidulae, 5-8 x 3-3.5 μ, distichae. Paraphyses?

LUZON, Prov. Laguna, Los Baños, *Baker 766*, Jan., 1913. Ad petioles emortuos *Coryphae elatae.*

Gehört zu den wenigen *Sphaeroxylon* Arten mit so kleinen, hier noch nicht völlig reifen Sporen und unterscheidet sich von *Hyp. moriforme* E. et Ev. durch nicht warziges Stroma, von *Hyp. atrorufulum* E. et Ev. durch kaum angedeutete Ostiola, steht wohl am nächsten *Hyp. porosum* Mont.

NUMMULARIA Tulasne

NUMMULARIA ? SCUTATA Berk. et Cooke in Grevillea 12: 6. Cfr. Sacc. Syll. 9: 572.

Stromata cortici innata, mox denudata, ab cortice lacerata cincta, solitaria, demum confluentia, orbicularia, applanata, cinereo-nigra, 1–2 cm diam., 0.3–0.4 mm. cr., carbonacea, glabra. Perithecia monostiche arcte congregata, globulosa, 0.15–0.2 mm lat., ostiolis in superficie stromatis minimis haud perspicuis. Asci cylindracei, teneri, p. sporif. 45–5 μ, 8-spori, I—. Sporae oblongae vel ellipsoideae, rectae, 1-cellulares, non guttatae, fuscae, 5 x 2–2.5 μ, 1-stichae. Paraphyses haud conspicuae.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo* comm. *Baker 811*, Feb., 1913. Ad ramos emortuos *Litseae glutinosae.*

Stimmt sehr gut zu der allerdings l. c. mangelhaften Beschreibung, die deshalb erweitert wurde. Nächst verwandt erscheint *Nummularia microplaca* (B. et C.) Sacc. Syll. 1: 298.

NUMMULARIA ANTHRACINA (Kze. et Schm.) Trav. Flor. It. Cr. 2: 57.

Sphaeria anthracina Kze. et Schm. Myc. Hefte 1: 55.
Sphaeria nummularia DC. Fl. Fr. 2: 290.
Nummularia Bulliardi Tul. Sel. Fung. Carp. 2: 43.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *Baker 726*, Jan., 1913. Ad ramulos *Tamarindi indicae.*

ROSELLINIA De Notaris

ROSELLINIA BAMBUSAE P. Henn. in Hedwigia 47: 250.

LUZON, Prov. Laguna, Los Baños, *Baker 890*, April, 1913. Ad *Bambusam* emortuam.

Offenbar sind die Perithecien zuerst in die Rinde eingesenkt, brechen hervor und sind nach deren Abfall, 1.5 mm breit, mit ihren anhängenden Resten stark umhüllt.

ROSELLINIA ? AUCKLANDICA Rabenh. in Hedwigia (1878) 115.

LUZON, Prov. Laguna, Mount Maquiling, *M. B. Raimundo* comm. *Baker 901*, April, 1913. Ad ligna emortua in silva.

Stimmt sehr gut zur Beschreibung. Cfr. Sacc. Syll. 1: 256. Auch *Rosellinia leprantha* (Fr.) l. c. p. 255 ist offenbar nächst stehend und gehören beide zur Verwandtschaft von *Rosellinia aquila* (Fr.) De Not.

METASPHAERIA Saccardo

METASPHAERIA MACULANS Rehm sp. nov.

Perithecia in peridermio late hyphis plurimis fuscidulis, ramosis 3 μ cr. intercellulariter repentibus fuscato gregaria globulosa, parte inferiore innata, minutissime papillulata, nigra, 0.25 mm lata, glabra, membranacea contexta. Asci clavati, sessiles, 120 x 10 μ, 8-spori. Sporae fusiformes, utrinque acutatae, 3-(?–5) septatae, medio constrictae, cellula superiore secunda latiore, hyalinae, 30 x 9–10 μ, distichae. Paraphyses filiformes.

LUZON, Prov. Laguna, Los Baños, *S. A. Reyes* comm. *Baker 969*, April, 1913. Ad petiolos *Arengae.*

Die Hyphenbildung im Parenchym steht in Zusammenhang mit der Entwicklung der Perithecien.

MELANOMMA Nitschke & Fuckel

MELANOMMA MINDORENSE Rehm sp. nov.

Perithecia gregaria, sessilia, modo basi innata, conoidea, vix papillulata, glabra, nigra, subcarbonacea, 0.5–0.8 mm lat. Asci clavati, apice rotundati, c. 150 x 18 μ, 8-spori. Sporae ellipsoideae, 3-septatae, cellula 3 latiore, quaque cellula 1 guttata, ad septa subconstrictae, primitus hyalinae, demum fusco-luteae, interdum cellulis apicalibus dilutioribus, 30–33 x 10 μ, distichae. Paraphyses filiformes, septatae.

LUZON, Prov. Laguna, Los Baños, *E. B. Copeland* comm. *Baker 860*, March, 1913. Ad *Arengam mindorensem* emortuam.

Die ausgestossenen Sporen sind immer dunkelbraun, sie gleichen denen von *Melanomma dubiosum* Sacc. Syll. 1: 303, Cf. Berlese Ic. Fung. 1: 34 *tab. 23, f. l.* ferner denen von *Melanomma Victoris* Speg. Cfr. Sacc. Syll. 16: 53.

CORYNELIACEAE

CORYNELIA Acharius

CORYNELIA CLAVATA (L.) Sacc. in Pirotta Oss. fungh. N. G. B. 1 (1889) 313.

Mucor clavatus L. Spec. Plant. Suppl. p. 453.
Corynelia uberata Fr. Obs. Myc. 2: 343.

LUZON, Prov. Laguna, Mount Banajao, *E. B. Copeland* comm. *Baker 851* (immatura), *F. C. Gates* comm. *Baker 910* Feb., 1913. Ad folia *Podocarpi costati.*

Cfr. Starbäck Ark. for Bot. 7: 20; C. *clavata*, der alten Welt angehörig, wird in Sacc. Syll. 16: 650 unrichtig mit 2 in Südamerika auf *Podocarpus* wachsenden, durch die Form der Perithecien wesentlich verschiedenen Arten vereinigt, was auch reichliche Exemplare meines Herbariums beweisen.

VALSACEAE

EUTYPA Tulasne

EUTYPA FLAVOVIRENS (Hoffm.) Tul. Sel. Fung. Carp. 2: 57.

LUZON, Prov. Laguna, Los Baños, *E. B. Copeland* comm. *Baker 894a*, April, 1913. Ad lignum emortuum in silva.

EUTYPA LUDIBUNDA Sacc. in Michelia 1: 15, 150. Cfr. Berlese Ic. Fung. 3: 50.

LUZON, Prov. Laguna, Los Baños, *E. B. Copeland* comm. *Baker 894b*, April, 1913. Ad lignum emortuum in silva.

EUTYPA CORNICULATA (Ehrh.) Rehm.

Peroneutypa corniculata Berl. Ic. Fung. 3: 80, *t. 97.*

LUZON, Prov. Laguna, Mount Maquiling, *M. B. Raimundo*, comm. *Baker 902*, April, 1913. Ad ramos emortuos in silva.

Gehört zu *Eutypa* nach seiner ganzen Beschaffenheit, die cylindrischen Ostiola sind stellenweise sehr schön entwickelt. Ob die Angaben Berleses betr. Ehrh., Grev., Berk. et Br. richtig sind, wird sich kaum feststellen lassen.

PERONEUTYPELLA Berlese

PERONEUTYPELLA COCOES Sydow in Ann. Myc. 9: 145.

LUZON, Prov. Laguna, Los Baños, *Baker 673*. Ad tunicam nucis *Cocos.*

HYSTERIALES

HYPODERMATACEAE

LOPHODERMIUM Chevallier

LOPHODERMIUM PASSIFLORAE Rehm sp. nov.

Apothecia in cortice haud decolorato dispersa innata, caulis longitudini parallela, linearia, recta, utrinque vix acutata, glabra, nigra, 2–4 mm longa, 0.4 mm lata, media rima longitudinali percursa, lobiis acutis vix distantibus. Asci cylindracei, apice

rotundati, 75–80 x 5–6 μ, 8-spori. Sporae filiformes, rectae, guttulatae, hyalinae, 70 x 1 μ, parallele positae. Paraphyses filiformes, hyalinae, ad apicem 2 μ crassae.

LUZON, Prov. Laguna, Los Baños, *Baker 40* (*b*), Dec., 1912. Ad caules emortuos *Passiflorae quadrangularis.*

Steht dem *Lophodermium javanicum* Penz. et Sacc. zunächst und ist an den Pilzbedeckten Stengeln schwer erkennbar.

HYSTERIACEAE

MORENOELLA Spegazzani

MORENOELLA BREVIUSCULA (Penz. et Sacc.) v. Höhnel Fragm. Myc. 9: 55.

Lembosia breviuscula Penzig et Sacc. in Malpighia 11 (1897) 527. Cfr. Sacc. Syll. 14: 715 sub *Lembosia diffusa* Winter; Sydow Ann. Myc. 2: 162.

Morenoella gedeana Racib. Paras. Pilze und Algen Javas 3 (1900) 28. Cfr. Sacc. Syll. 6: 654.

Dimerosporium pangerangense P. Henn. et G. Nym. in Monsunia 1 (1899) 159. Cfr. Sacc. Syll. 16: 410.

LUZON, Prov. Laguna, Mount Banajao, *E. B. Copeland* comm. *Baker 839.* Ad paginam inferiorem foliorum *Rhododendri schadenbergii.*

Von Höhnel in litt. gibt und bestätigt obige Benennung dieses schönen Pyrenomyceten auf Grund eigener Untersuchung.

STICTIDACEAE

STICTIS Persoon

STICTIS STELLATA Wallr. Fl. Crypt. Germ. 2: 144.

Schizoxylon stellatum Fuckel Symb. Myc. 251.

Var. **PHILIPPINENSIS** Rehm var. nov.

Sporae filiformes, c. 60 cellulares, cellulis 2–4 μ longis, 2–3 μ latis, demum ad septa subconstrictae. Paraphyses apice ramulosae. Epithecium hyalinum formates, Jodii ope coerulee tinctum.

LUZON, Prov. Laguna, Los Baños, *E. B. Copeland* comm. *Baker 887,* April, 1913. Ad ramulos emortuos ?*Daemonoropsidis.*

Optime congruit cum specie designata, inprimis var. *pallidula* Sacc. in Michelia 2: 614, Fung. It. Sel. 1422, differt modo It.

PHACIDIACEAE

COCCOMYCES De Notaris

COCCOMYCES CANARII Rehm sp. nov.

In maculis foliorum plane exaridis, dilute luteolis, irregulariter orbicularibus 0.3–2 cm diam. apothecia dispersa epiphylla innata,

orbicularia, convexula, nigre tecta, nitentia, 0.3–0.5 mm diam., primitus clausa, dein, epiphyllo tegente laciniato, denudata, patellaria, hyalina. Asci cylindracei, 100 x 4 μ, apice rotundati, 8-spori I—. Sporae filiformes, tenuissimae, hyalinae, 0.05 μ cr., parallelae. Paraphyses filiformes, rectae, hyalinae, 1 μ.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *Baker 703*. Ad folia *Canarii*.

Ein winziger *Coccomyces* mit leider noch unentwickelten und Sporen.

PEZIZELLEAE

BIATORINA Th. Fries

BIATORINA SUBLUTEA Rehm sp. nov.

Apothecia in pagina superiore foliorum dispersa sessilia, mycelio nullo conspicuo, biatorina, urceolata, margine crasso cincta, glabra, flavido lutea, in hypothecio gonidia algarum viridium conspicua, 0.25 mm lat. Asci clavati, 35 x 9 μ, 8-spori. Sporae fusiformes, rectae, medio septatae, non constrictae, hyalinae, 12 x 3 μ, distichae. Paraphyses filiformes, hyalinae. Epithecium formantes. Hymenium I+.

LUZON, Prov. Laguna, Los Baños, *Baker 907*, April, 1913. Ad folia *Ardisiae*.

Gehört zu den Flechten.

PSOROTHECIOPSIS Rehm

PSOROTHECIOPSIS DECIPIENS Rehm in Hedwigia (1900) 217, tab. XI, *fig. 13*.

Var. **BISPORA** Rehm in Hedwigia (1905) *f. 9*. Cfr. Sacc. Syll. 16: 746, 18: 98.

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo*, comm. *Baker 744c*. Ad folia *Alstoniae scholaris*.

MELLITOSPORIOPSIS Rehm

MELLITOSPORIOPSIS PSEUDOPEZIZOIDES Rehm in Hedwigia (1900).

LUZON, Prov. Laguna, Los Baños, *M. B. Raimundo* comm. *Baker 744b*. Ad folia *Alstoniae scholaris*.

PEZIZACEAE

HUMARIA Fries

HUMARIA GRANULATA (Bull. Champ. 258, *pl. 433 f. 3* sub *Peziza*) Quelet Enchir. Fung. 290.

Copnobia granulata Boud. Class. Disc. 69.

Ascobolus granulatus Fuckel Symb. Myc. 288.

Var. MICROSPORA Rehm var. nov.

Apothecia 1–2 mm lata. Sporae oblongae, utrinque rotundatae, 1-cellulares, non guttatae, hyalinae, 10–12 4–4.5 μ.

LUZON, Prov. Laguna, Mount Banajao, *E. B. Copeland* comm. *Baker 803*, Feb., 1913. Ad fimum alicujus Herbivori.

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NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, VI[1]

BY OAKES AMES

(From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.)

One plate

In the following paper forty-seven new species of Philippine orchids are proposed and described. Of these eighteen are from Mindanao, fifteen from Luzon, ten from Leyte, two from Mindoro, one from the Babuyanes Islands, and one (*Dendrobium verruculosum*) from no specific locality, but presumably from Luzon.

To my previously published notes the following groups are additions: *Camarotis* Lindl., *Glomera* Blume, *Thecostele* Reichb. f., *Hippeophyllum* Schlecht., and § *Eudendrochilum* of the genus *Dendrochilum* Blume.

My conception of *Camarotis philippinensis* Lindl. is based on specimens from Leyte collected by Mr. C. A. Wenzel. These specimens agree with Lindley's original diagnosis published in the Journal of the Linnean Society, and with a tracing in my possession taken from a drawing by Lindley on the type sheet of *Camarotis philippinensis* Lindl. preserved in the Kew Herbarium.

Where measurements are given in the following descriptions they usually cover the range of variation exhibited by a series of specimens, otherwise they are maxima rather than averages.

The genera are arranged in accordance with the sequence adopted by Pfitzer in Engler & Prantl's "Die natürlichen Pflan-

[1] Proof read by E. D. Merrill.

zenfamilien." When more than one specimen is cited the first is to be taken as the type. Excepting those species collected by Wenzel in Leyte, and by Weber, Reillo, Serrato, Lyon, and Disdan, the types are preserved in the Herbarium of the Bureau of Science at Manila, and the cotypes in my herbarium. The types of the species collected by the individuals named above are preserved in my herbarium.

ADENOSTYLIS Blume

1. **ADENOSTYLIS ELMERI** Ames in Elm. Leafl. Philip. Bot. 5 (1912) 1552.

This interesting species has been found again by Father M. Vanoverbergh in Bontoc Subprovince, Luzon. The type was collected in Baguio, Province of Benguet, in March, 1907, by A. D. E. Elmer, 5,000 feet above sea level. From *A. marivelensis* Ames this species is to be distinguished by its much smaller flowers.

LUZON, Bontoc Subprovince, in dry forests, 1,300 m above sea level, *Father M. Vanoverbergh 1099*, January 5, 1911.

2. **ADENOSTYLIS (ZEUXINE) VANOVERBERGHII** sp. nov.

Aff. *Z. abbreviatae* Hook. Herba terrestris. Rhizoma succulentum, ad nodos radicans. Caules 2.8–4.6 dm alti, succulenti, supra pubescentes. Folia prope medium caulem conferta. Bases foliorum vaginatae, scariosae, amplae. Lamina ovato-lanceolata, acuta, membranacea, 5–15.5 cm longa, usque ad 4 cm lata, in petiola sulcata contracta, variabilis. Recemus 8–12 cm longus, laxus. Bracteae inflorescentiae lanceolatae, acutae, circiter 1 cm longae, pubescentes. Flores ±15, vel plures. Pedicelli, ut videtur, nulli. Ovarium circiter 12 mm longum, glabrum, supra valde contractum. Sepala lateralia ovata, acuta, 1-nervia, 11 mm longa, usque ad 4 mm lata. Sepalum dorsale simile, cum petalis membranaceis connivens. Petala sublanceolata vel inaequaliter ovata, acuminata, 1-nervia prope marginem posteriorem, 6 mm longa, 4 mm lata. Labellum 7.5 mm longum, ad basim saccatum vel valde concavum, super medium constrictum, ad apicem dilatatum, in lobos 2 magnos divergentes divisum, dente minuto terminali, lobi lanceolati, valde acuminati, 3 mm longi, prope basim circiter 2 mm lati; per medium saccum carina elevata in callum permagnum, bilobum, desinens; ad basim sacci utroque appendix carnosa, complanata. Columna crassa, columnae *Z. abbreviatae* Hook. similis.

LUZON, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 1490*, September 19, 1912, in wet forests, 1,600 m above sea level. Sepals brown, petals white, labellum brown and white.

Adenostylis Vanoverberghii resembles very closely *Zeuxine abbreviata* Hook. f. of India, both in the general habit of the plant and in the details of the calli on the disc of the labellum. The leaves of *Zeuxine abbreviata*,

however, are much narrower in proportion to their length, the petals are narrower and falcate rather than asymmetrically ovate as in *Adenostylis Vanoverberghii*. Furthermore, the terminal lobes of the labellum in the present species are different from those of *Z. abbreviata* in outline and are drawn out into a slender tip.

GOODYERA R. Brown

GOODYERA RAMOSII sp. nov.

Herba terrestris. Aff. G. *reticulatae* Bl. et *G. clausae* (A. A. Eaton) Schltr. Rhizoma repens succulentum. Caules subdecumbentes vel erectiusculi, circiter 2 dm alti. Folia alterna, 4–7 cm longa, 12–25 mm lata, lanceolata, acuminata, valde acuta, chartacea, reticulato-nervosa, breviter petiolata. Petioli ad basim vaginati ±1 cm longi. Bracteae lanceolatae ±15 mm longae; bracteae inflorescentiae ±1 cm longae, floribus longiores. Racemus densiflorus, usque ad 7 cm longus. Flores minuti, secundi, vel subsecundi. Sepala lateralia 3 mm longa, circiter 2 mm lata, oblongi-elliptica, obtusa. Sepalum dorsale suborbiculare, concaviusculum. Petala circiter 3 mm longa, cuneato-spathulata, 1-nervia. Labellum 3.5–4 mm longum, leviter saccatum, suborbiculare, subacutum, intus pubescens. Gynostemium breve, erectum, antice ad apicem rostello obtuso tandem emarginato terminatum.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14421 Ramos.*

Among the recorded species of this genus now known to occur in the Philippine Islands *Goodyera Ramosii* is most closely allied to *G. clausa* (A. A. Eaton) Schltr., from which it is separable by its different foliage and by the absence of the two fleshy appendages among the papillae on the inside of the saccate labellum. From the dried specimens examined the leaves appear to have been dark green with whitish nerves and with a broad band of white along the middle. The flowers appear to have been reddish.

In the Proceedings of the Biological Society of Washington 21: 63, A. A. Eaton, in a paper entitled "Nomenclatorial Studies in Three Orchid Genera" gave his reasons for assembling under the genus *Epipactis* (Haller) Boehm. the species usually referred to *Goodyera* R. Br. He assumed that the genus *Epipactis* was properly made by Böhmer in 1760 to include the species designated by Linnaeus as *Satyrium repens* and later known as *Goodyera repens* R. Br. Recent investigations by Dr. P. A. Rydberg, assisted by Dr. J. H. Barnhardt (Torreya 12:89) have revealed a reference pertinent to this subject which must have escaped Mr. Eaton's attention. This reference is to Zinn's "Catalogus Plantarum Horti Academici et Agri Gottingensis." On page 86 of this work, which is dated 1757, two subgenera, namely 1. *Helleborine* and 2. *Ophrys* are given under *Epipactis*. Dr. Rydberg shows quite conclusively that in view of this work Eaton's treatment is untenable and that the generic name *Epipactis* is not available for the species recently removed from *Goodyera*. It would seem, then, that *Goodyera* must be reinstated. *Peranium* Salisb. was published without characterization and therefore, according to the Vienna Code, has no standing, although it antedates *Goodyera*.

DENDROCHILUM Blume

1. DENDROCHILUM (§ PLATYCLINIS) RAMOSII sp. nov.

Aff. D. *filiformi* Lindl. Herba epiphytica, pergracilis. Pseudobulbi conferti, in sicco valde rugosi, pyriformi, in sicco flavidi, juniores vaginis mox in fibras solutis inclusi, in rhizomate repenti dense seriati, monophylli, circiter 2.5 cm longi. Folium petiolatum ±15 cm longum, circiter 1 cm longum lineari-lanceolatum, acutum, ad basim attenuatum, nervo medio subtus prominenti. Pedunculus terminalis, filiformis, apicem folii superans, usque ad racemum circiter 20 cm longus. Racemus pergracilis, multiflorus, usque ad 11 cm longus, pendulus. Flores flavidi, circiter 5 mm in diametro inter apices sepalorum lateralium explanatorum. Bracteae inflorescentiae glumaceae, circiter 1 mm longae, pedicello cum ovario longiores. Sepala lateralia oblongi-lanceolata, acuta, 3-nervia, 2.5 mm longa, circiter 1.5 mm lata, submembranacea. Sepalum dorsale simile. Petala cuneato-obovata, obtusa, 3-nervia, 2.5 mm longa, 1.75 mm lata. Labellum 2 mm longum, longius quam latius, subintegerrimum vel leviter subpanduratum, 3-nervium, bilamellatum. Lamellae prope basim labelli, minuti. Ad basim labelli prope columnam callus leviter incrassatus. Columnae laciniae laterales ferme basilares 0.75 mm longae, subacutae, erectae.

LUZON, Laguna Province, San Antonio, *Bur. Sci. 15003 Ramos*, June 13, 1912.

Dendrochilum Ramosii is a near ally of *D. filiforme* Lindl. from which it differs in the form of the labellum, and in the smaller flowers. In habit it resembles rather closely *D. graciliscapum* (Ames) Pfitzer. In dried specimens the flowers are brownish. The collector describes the flowers of living specimens as "orange, nearly yellow."

2. DENDROCHILUM (§ EUDENDROCHILUM) WEBERI sp. nov.

Habitu *D. aurantiaco* Bl. haud dissimilis. Pseudobulbi anguste fusiformes, in sicco flavidi et valde rugosi, circiter 3 cm longi, monophylli, in rhizomate longe repente, lignoso, teretes, distantes. Bracteae ad basim pseudobulborum imbricatae. Folium in petiolum brevissimum sensim angustatum, oblongi-lanceolatum, coriaceum, acutum, usque ad 8.5 cm longum, 12–20 mm latum. Scapus heteranthus, mox sub pseudobulbo, mox ad nodum proximum rhizomatis insertus. Racemus suberectus, multiflorus; rhachis glabra. Bracteae inflorescentiae scariosae, distichae, quam ovaria pedicellata paulo breviores, circiter 2 mm longae. Sepala lateralia lanceolata, acuta, subcrassa, 4 mm longa, circiter 1 mm lata, patentia. Sepalum dorsale simile. Petala linearilanceolata vel longe spathulata, 3–5 mm longa. Labellum pan-

duratum, valde obtusum, carinae 2 canaliculo separato a basi ad medium labellum extensae. Gynostemium breve, circiter 2 mm longum, crassum, stelidia in media columna inserta, ala apicalis retusa vel bidentata.

MINDANAO, Subprovince of Agusan, Cabadbaran, *C. M. Weber 59*, March, 1911.

Dendrochilum Weberi is the first representative of § *Eudendrochilum* which has been reported from the Philippine Islands. In general habit it resembles *D. aurantiacum* Bl. very closely, but in the details of the flower it is quite distinct. According to notes made by Mr. Weber the flowers are cream-colored. In dried specimens they are brownish. By the addition of *D. Weberi* to the genus every section of *Dendrochilum* is now represented in the Philippines, the sections *Acoridium* and *Platyclinis* by numerous species, § *Pseudacoridium* by *D. Woodianum* and § *Eudendrochilum* by *D. Weberi.*

MALAXIS Swartz

1. MALAXIS ARIETINA sp. nov.

Caulis subincrassatus, 3–5 cm altus, bracteis subarcte appressis vaginantibus tectus. Folia chartacea, late ovato-lanceolata, acuminata, acuta, breviter petiolata, 2.5–10 cm longa, 1–4.8 cm lata, subcordata. Pedunculus cum racemo 9–26 cm longus, gracilis. Racemus laxiflorus usque ad 15 cm longus. Flores succedanei, eodem tempore perpauci aperti. Bracteae inflorescentiae retroflexae, lanceolatae, valde acute, 1–4 mm longae, pedicellis breviores. Sepala lateralia suborbicularia, nervosa, 4 mm longa, 4 mm lata. Sepalum dorsale ovato-lanceolatum, 5 mm longum, 4.5 mm latum, acutum. Petala linearia, 6 mm longa, 1-nervia. Labellum sagittatum, arietinum, apiculatum, auriculis oblongi-falcatis, 4 mm longis. Gynostemium crassum auriculis obtusis divergentibus.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14418 Ramos,* March–April, 1912.

The labellum is quite distinctive, the auricles being strongly curved and in conjunction with the terminal portion resembling a ram's head. In dried specimens the flowers are yellowish, six or seven being open at the same time. In mature specimens flowers and fruit are present together. Each plant bears two or three leaves.

2. MALAXIS LONGIPEDUNCULATA sp. nov.

Herba terrestris. Caulis gracilis, foliosus. Folia 6, membranacea cum petiolo usque ad 9.5 longa, 2.3–3.1 cm lata, lamina ovato-lanceolata, circiter 8 cm longa, in sicco nervosa, acuminata, acuta. Petioli vaginantes, sulcati. Pedunculus 2.5–2.6 cm longus, bracteis dependentibus, linearibus vel lanceolatis, 4–5 mm longis, acuminatis. Flores succedanei, flavidi. Racemus usque

ad 17 cm longus, gracilis, multiflorus. Sepala lateralia oblongi-elliptica, valde obtusa, 2 mm longa, 1.5 mm lata, membranacea. Sepalum dorsale simile circiter 2.5 mm longum. Petala linearia obtusa circiter 2 mm longa. Labellum antice 3-lobatum et bidentatum: lobus medius 1 mm longus, leviter retusus, rotundatus, lobi laterales acuti; in sinu utroque prope basim lobi medii dens stat; auriculae magnae, obtusae, 2 mm longae. Ad basim labelli, prope columnam, callus cucullatus. Gynostemium breve, auriculis obtusis.

LEYTE, Dagami, *C. A. Wenzel 52*, November 29, 1912, in soil in deep shade of forest.

The lobing of the labellum recalls *Malaxis commelinifolia* (Zoll.) O. Ktze., although there is no close relationship between the two species. Mr. Wenzel's field notes indicate that the color of the flowers in living specimens is brownish-yellow.

3. MALAXIS WENZELII sp. nov.

Herba terrestris in sylvis umbrosis, 2.5–3.1 dm alta, foliosa. Caulis abbreviatus, circiter 9 cm longus, 6–8-foliatus. Folia petiolata, chartacea, elliptico-lanceolata, acuminata, acuta, usque ad 1.5 dm longa cum petiolo, 4 cm. lata. Petiolus canaliculatus cum vagina tubulosa. Inflorescentia erecta; racemus cum pedunculo 1.5–2.3 dm longus, laxe multiflorus. Bracteae elongatae, subreflexae, lineariae. Sepala lateralia elliptico-ovata, obtusa, 3 mm longa, circiter 2 mm lata, 3-nervia. Sepalum dorsale elliptico-oblongum, obtusum, 4 mm longum. Petala linearioblonga, ad apicem irregulariter truncata, uninervia, circiter 4 mm longa, usque ad 1 mm lata. Labellum basi sagittatum, antice quadridentatum, dentes lineares, subfalcati, exteriores 1.5–2 mm longi, interiores circiter 1 mm longi. Auriculae anguste triangulares, acutae, 4 mm longae. Lamina fovea elliptica, margine hippocrepiforme-incrassata donata. Gynostemium breve, auriculis obtusis.

LEYTE, Dagami, *C. A. Wenzel 34*, October 21, 1912, in deep shade of forest, alt. 60 m, flower pink and green, with rank odor.

Malaxis Wenzelii appears to be near *Microstylis retusus* J. J. Smith, from which it differs in the form and distribution of the teeth of the labellum. In addition to the four terminal teeth of the labellum in *M. Wenzelii* sometimes an additional, very short, tooth occurs laterally or between the middle pair.

CESTICHIS Pfitzer

CESTICHIS FRAGILIS sp. nov.

Herba epiphytica. Rhizoma repens. Pseudobulbi ±5 cm distantes, 3.5–4 cm longi, graciles, infra aliquanto incrassati, vaginis laxis vestiti, monophylli. Folium subcoriaceum, usque ad 18 cm

longum, circiter 1.4 cm latum, anguste oblanceolatum, acutum, erectum. Scapus gracilis, foliis longior, flexuosus, circiter 1.5 dm longus. Bracteae inflorescentiae distichae, confertae, conduplicatae, circiter 5 mm longae, valde acutae. Racemus usque ad 3.5 cm longus, complanatus, circiter 5 mm in diametro. Flores flavidi, fragiles, succedanei, eodem tempore singuli vel perpauci aperti. Sepala lateralia oblongi-lanceolata, acuta, 5 mm longa, 1.25 mm lata. Sepalum dorsale simile. Petala filiformia, circiter 5 mm longa. Labellum panduratum, circiter 5 mm longum, retuso-apiculatum, ad basim callo cucullato instructum. Columna gracilis, valde arcuata, prope apicem dilatata.

MINDANAO, District of Zamboanga, *Merrill 8184*, November 5, 1911.

Cestichis fragilis resembles most closely in general habit *C. gracilis* and *C. disticha*. From the former it is easily distinguishable by the broader leaves and from the latter by the construction of the labellum.

OBERONIA Lindley

1. OBERONIA TOPPINGII sp. nov.

Planta acaulescens, in toto 1 dm alta. Folia imbricata, usque ad 6 cm longa, lineari-lanceolata, circiter 5 mm lata a latere visa. Pedunculus cum racemo 6–10 cm longus, gracilis, densiflorus. Flores subverticellati, minuti. Bracteae inflorescentiae integerrimae, lineares, flores subexcedentes, scariosae in sicco. Sepala lateralia triangulari-ovata, acuta 0.75 mm lata. Sepalum dorsale simile. Petala oblonga, irregulariter dentata, 0.5 mm longa. Labellum 3-lobatum; lobi laterales tripartiti, divisiones filiformes, lobus medius obcuneatus, antice utrinque in divisiones duo productus.

LUZON, Province of Rizal, Wawa, *D. LeRoy Topping s. n.*, October, 1908.

The form of the labellum is not dissimilar from that of *Oberonia insectifera* Hook. f. Among Philippine species it is very distinct.

HIPPEOPHYLLUM Schlechter

1. HIPPEOPHYLLUM WENZELII sp. nov.

Herba epiphytica circiter 2 dm alta usque ad apicem inflorescentiae. Folia ±4, ensiformia, falcata, acuta, circiter 11 cm longa, ±5 mm lata et lineari-lanceolata a latere visa, erecta, coriacea, articulata, bases foliorum imbricatae, usque ad 2.5 cm longae. Pedunculus elongatus, multo folia exedens, multibracteatus, erectus, multiflorus, circiter 1.5 dm longus. Bracteae glumaceae, erectae, lanceolatae, acutae, arcte appressae vel ascendentes, infra flores vix patentes, circiter 5 mm longae, minute denticulatae, margine hyalino. Flores densi, in racemo spicato,

virides. Sepala lateralia oblongi-lanceolata, acuta, 2.5 mm longa. Sepalum dorsale simile, 1 mm latum, uninervium. Petala spathulata, subacuta, uninervia, 2.5 mm longa, 0.75 mm lata. Labellum 3-lobatum, 2.5 mm longum, lobi laterales erecti, valde falcati, acuti, 0.75 mm longi, lobus medius oblongus, ad apicem rotundatus, 1.5 mm longus, circiter 1 mm latus. Columna cylindracea infra clinandrium.

LEYTE, Dagami, *C. A. Wenzel 20*, December 21, 1912, on trees, 60 m above sea level.

This species resembles *Oberonia cylindrica* Lindl. from which it is easily distinguishable by the entire lobes of the strongly 3-lobed labellum.

PODOCHILINAE

Doctor R. Schlechter in "Die Orchidaceen von Deutsch-Neu-Guinea" (1: 324) proposes a new arrangement of the species composing the group of the *Podochilinae* which departs radically from his earlier arrangement published in 1900 in Mém. Herb. Boiss. 21 (1900) 1–78. In the earlier work *Podochilus* included all the species which were at that time referable, chiefly by the number of pollen masses, either to *Podochilus* or *Appendicula*, groups which were distinguishable from the other genera of the *Podochilinae* by the column being produced into a foot. The new arrangement presents five genera, two of which, namely *Podochilus* and *Appendicula*, are found widely distributed in the Philippine Islands, the former composed of two, the latter of five sections, four of which contain Philippine species.

The reasons for the new arrangement are the result of recent and extensive studies of living material in the field.

Herbarium material of the genera *Podochilus* and *Appendicula* is, as a rule, most unsatisfactory, the flowers either lacking or when present frequently being without the pollen masses. As originally conceived the chief distinction between *Podochilus* and *Appendicula* was the number of pollen masses; 4 in *Podochilus*, 6 in *Appendicula*.

Although Dr. Schlechter has, in his recent work, given weighty reasons to uphold his distribution of the species into genera and sections, the lines of demarcation may not, as new species are described, prove so well defined in the future as they appear to be at present. His sections in my opinion are unnecessarily artificial, and if convenience is considered, his change of view as to generic limitations will not simplify the labors of those who attempt to follow him.

That *Podochilus* and *Appendicula* constitute two well defined genera is the opinion of two careful students of the orchid family who have arrived at their conclusion after an examination of fresh material. J. J. Smith in his "Die Orchideen von Java," and now Schlechter in his exhaustive "Die Orchidaceen von Deutsch-Neu-Guinea" both agree in upholding *Podochilus* and *Appendicula*.

The following arrangement of the Philippine species is based on Schlechter's treatment.

Pollinia 4 ..... *Podochilus* Blume
Pollinia 6 ..... *Appendicula* Blume

PODOCHILUS Blume

§ I. **Apista.** Pollinia 4 on a single viscid gland.
§ II. **Diadena.** Pollinia 4 in pairs on separate viscid glands.

§ I. APISTA

1. **Podochilus Cumingii** Schlechter in Fedde Repertorium 3: 19.
2. **Podochilus longilabris** Ames in Elm. Leafl. Philip. Bot. 5: 1565.
3. **Podochilus Robinsonii** Ames in Phil. Journ. Sci. Bot. 6: 49.
4. **Podochilus strictus** Ames in Phil. Journ. Sci. Bot. 4: 669.

§ II. DIADENA

5. **Podochilus bicaudatum** Schlechter in Fedde Repertorium 3: 19
6. **Podochilus intricatus** Ames, below.
7. **Podochilus plumosus** Ames in Phil. Journ. Sci. Bot. 4: 668.
8. **Podochilus Ramosii** Ames, below.

APPENDICULA Blume

§ I. **Eu-Appendicula.** Inflorescence abbreviated, lateral or lateral and terminal.
§ II. **Chaunodesme.** Inflorescence chiefly terminal, bracts strongly reflexed.
§ III. **Pododesme.** Inflorescence elongated, lateral or terminal, peduncle closely sheathed with elongated bracts.
§ IV. **Oligodesme.** No Philippine species recorded.
§ V. **Chromatodesme.** Inflorescence with large imbricating bracts which are said to be white or red.

§ EU-APPENDICULA

1. **Appendicula anceps** Bl. Bijdr. 299.
2. **Appendicula Clemensiae** n. comb. *Podochilus Clemensiae* Ames in Phil. Journ. Sci. Bot. 4: 667.
3. **Appendicula cornuta** Bl. Bijdr. 302.
4. **Appendicula fruticosa** n. comb. *Podochilus fruticosus* Ames in Phil. Journ. Sci. Bot. 6: 48
5. **Appendicula Fenixii** (Ames) Schlechter Die Orch. von Deutsch-Neu-Guinea 1: 336.
6. **Appendicula malindangensis** (Ames) Schlechter l. c. 1: 337
7. **Appendicula micrantha** Lindl. in Ann. Nat. Hist. 15: 386
8. **Appendicula Wenzelii** Ames, below.

§ CHAUNODESME

9. **Appendicula lucbanensis** comb. nov. *Podochilus lucbanensis* Ames in Elm. Leafl. Philip. Bot. 5: 1566.
10. **Appendicula luzonensis** comb. nov. *Podochilus luzonensis* Ames in Elm. Leafl. Philip. Bot. 5: 1567.
11. **Appendicula maquilingensis** Ames, below.
12. **Appendicula Merrillii** Ames, below.
13. **Appendicula pendula** Bl. Bijdr. 298.
14. **Appendicula perplexa** comb. nov. *Podochilus perplexus* Ames in Elm. Leafl. Philip. Bot. 5: 1569.
15. **Appendicula philippinensis** (Schlechter) J. J. Smith.
16. **Appendicula xytriophora** Reichb. f. in Seem. Fl. Vit. 209.

§ PODODESME

17. **Appendicula Elmeri** comb. nov. *Podochilus Elmeri* Ames in Elm. Leafl. Philip. Bot. 5: 1565.
18. **Appendicula undulata var. calcarata** (Schlechter).
19. **Appendicula negrosiana** comb. nov. *Podochilus negrosianus* in Elm. Leafl. Philip. Bot. 5: 1568.
20. **Appendicula Weberi** Ames, below.

§ CHROMATODESME [2]

21. **Appendicula crotalina** (Ames) Schltr. in Die Orch. von Deutsch-Neu-Guinea 1: 336.

PODOCHILUS Blume

1. PODOCHILUS (§ DIADENA) INTRICATUS sp. nov.

Herba epiphytica in sylvis, 1–2 dm alta, gracilis. Caules ramosi, flexuosi, foliosi. Folia disticha, linearia, acuta, apiculata, usque ad 11 mm longa, circiter 1.5 mm lata, subcoriacea. Flores albidi, terminales et laterales. Pedunculus folio brevior. Bracteae imbricatae, lanceolatae, acutae, glumaceae, circiter 2.5 mm longae. Sepala lateralia triangulari-lanceolata, acuta, acuminata, 3 mm longa, 1-nervia, vel intus carinata. Sepalum dorsale oblongi-lanceolatum, acuminatum, acutum. Petala oblongi-elliptica, obtusa, vel subacuta, uninervia, 2 mm longa, 1 mm lata. Labellum rhombicum, ad basim sagittatum vel bicaudatum, 2.5 mm longum, valde acutum, 3-nervium. Rostellum bifidum. Pollinia compressa, per paria calyptrata, paribus glandulae communi affixa.

LUZON, Province of Tayabas, Mt. Pular, at 600 m above sea level, January, 1913, *Clemente Disdon s. n.*

Undoubtedly a near relative of *Podochilus tenuis* Lindl. from which it is in part distinguishable by its broader, longer leaves, and by the flowers being both terminal and lateral. The details of the flower vary but slightly from those of *P. acicularis* illustrated in Hooker's Icones *pl. 2147*. Among Philippine species it is very closely related to *P. plumosus* Ames, but quite readily distinguishable by means of its broader leaves and stouter habit. In the details of the flower, however, it is very similar to *P. plumosus*, differing in slight characters which actual comparison of specimens side by side will reveal. Whether or not the vegetative characters which now seem to distinguish the plants will prove constant, further studies, with the aid of additional material, will show.

[2] The characteristic imbricating bracts of the inflorescence in this section are described as white or red by Dr. Schlechter. The field notes accompanying the specimens of *A. crotalina* made no mention of the color of the bracts.

2. **PODOCHILUS (§ DIADENA) RAMOSII** sp. nov.

Herba epithytica, pergracilis, prostrata vel suberecta. Caules vix 1 dm longi, simplices vel pauciramosi. Folia disticha, in sicco torta, usque ad 3 mm longa, vix 1 mm lata, oblonga, ad apicem mucronata. Racemus terminalis pauciflorus: flores albidi, 2 vel 3. Bracteae inflorescentiae lineari-lanceolatae, subrigidae. Sepala lateralia infra medium connata, uninervia, triangulari-lanceolata, vix 3 mm longa, mentum obtusum brevem formantia. Sepalum dorsale oblongi-ellipticum, valde concavum. Petala 2 mm longa, cuneato-spathulata, obtusa, uninervia. Labellum 2.5 mm longum vix 2 mm latum, ad basim cuneatum, supra medium subquadratum, ad apicem valde obtusum, circiter 1.5 mm latum, supra unguem subsagittatum, utroque incrassatum, non caudatum. Rostellum bifidum. Pollinia compressa per paria calyptrata, paribus glandulae communi affixa.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14441 Ramos*, March–April, 1912.

Podochilus Ramosii resembles very closely *P. tenuis* Lindl. in habit. The labellum is not at all caudate, but somewhat sagittate at the base, with the very short lobes thickened and callus-like in aspect. From the other species of Philippine distribution, which it resembles in habit, the form and structure of the labellum present reliable differentiating characters. The pollinia are paired, each pair with a calyptriform sheath at the base, which is connected to the viscid disc by a very slender support.

The specimens I have examined are creeping in moss, the stems intertwining and rooting at intervals along the leafy portion.

APPENDICULA Blume

1. **APPENDICULA (§ CHAUNODESME) MAQUILINGENSIS** sp. nov.

Caules graciles, infra medium teretes, superne subcomplanati ±25 cm longi. Folia disticha, oblongi-lanceolata, sensim acuminata, inaequaliter obtuse 2-dentata, mucronata, in sicco subchartacea, nervosa, usque ad 6 cm longa, 6-8 mm lata. Inflorescentia terminalis, multiflora, 4.5–5 cm longa, laxiflora. Bracteae valde deflexae oblongi-lanceolatae usque ad 3 mm longae, circiter 1 mm latae, subcoriaceae, virides. Flores flavidi, circiter 5 mm longi, patentes, resupinati. Pedicellus gracilis cum ovario 5–7 mm longus. Capsula usque ad 9 mm longa. Sepala lateralia antice triangularia, postice in mentum obtusum elongata, pars anterior 3 mm longa, 2 mm lata. Mentum 3.5 mm longum. Sepalum dorsale oblongi-lanceolatum, obtusum, vix 3 mm longum, circiter 1.5 mm latum. Petala oblonga, obtusa, leviter curvata, uninervia, vix 3 mm longa, circiter 1 mm lata. Labellum breviter unguiculatum ad basim concaviusculum, plus minus 4 mm longum, ad apicem 3–3.5 mm latum, leviter retusum subquadra-

tum, antice dilatatum. Callus hippocrepiformis, ad basim incrassatus, utrinque attenuatus. Gynostemium generis.

LUZON, Laguna Province, Mt. Maquiling, *Bur. Sci. 17114 Robinson*, December 8, 1912.

Appendicula maquilingensis resembles most closely among Philippine species *A. xytriophora* Reichb. f. The more compact inflorescence, different floral bracts, and the elongated, lanceolate leaves are differentiating characters. *A. lucbanensis* is also a nearly related species which is in part sufficiently characterized by the very different callus of the labellum.

2. APPENDICULA (§ CHAUNODESME) MERRILLII sp. nov.

Herba epiphytica, nana, 5 ad 18 cm alta. Folia disticha, oblongi-lanceolata, acuta, membranacea, 1.5–3 cm longa, decidua, circiter 7 mm lata, in petiolum infundibuliformem contracta. Inflorescentia terminalis, simplex vel ramosa, foliis longior, usque ad 3 cm longa. Pedunculus brevis. Bracteae inflorescentiae foliaceae, lanceolatae, acutae, pedicellis longiores. Racemus densiflores, flores albidi. Sepala lateralia ovato-lanceolata, mentum brevem formantia, acutiuscula, 3-nervia, 3.5 mm longa, circiter, 2.5 mm lata. Sepalum superius lanceolatum, obtusiusculum, sepalis lateralibus minus. Petala spathulata, obtusiuscula, ad basim attenuata, 3-nervia, 3.5 mm longa, circiter 1.5 mm lata. Labellum saccatum, pars superior rotundata, obtusa, lamella biloba in disco; prope apicem labelli tuberculum papilliforme. Gynostemium quadridentatum. Pollinia 6.

MINDANAO, District of Zamboanga, *Merrill 8135*, November, 1911.

Apparently a very distinct species clearly separable from all known representatives of the genus in the Philippines by the bilobed membranous callus on the disc of the lip, opposite the sinus of which, near the apex of the lip, a papilla-like tubercle is situated.

3. APPENDICULA (§ PODODESME) WEBERI sp. nov.

Ad truncos arborum in sylvis umbrosis. Caulis simplex vel pauciramosus, usque ad 2.5 dm altus, dense foliatus. Folia disticha, usque ad 11 mm longa, ± 8 mm lata, superne 1 cm longa, 4 mm lata, oblongi-elliptica, ad apicem subaequaliter rotundato-biloba cum mucrone breviore inter lobos. Inflorescentiae terminales et laterales. Pedunculi elongati, 4–12 cm longi, bracteis tubularibus in parte obtecti. Racemi nutantes, 9–20 mm longi. Bracteae inflorescentiae triangulari-lanceolatae, acutae, circiter 2 mm longae. Flores albidi, purpureo-striati. Sepala lateralia carinata, ovato-falcata, acuta, mentum formantia, 2.5 mm longa. Sepalum dorsale elliptico-lanceolatum, subacutum, carinatum. Petala 1.5 mm longa, oblonga vel oblongi-spathulata, uninervia, valde obtusa, saepius retusa. Labellum 2.5 mm longum, ob-

longum, valde obtusum vel truncatum, prope apicem leviter constrictum, ad basim concavum. Callus vel membrana, prope basim, cucullata. Rostellum breviter bifidum vel bifurcatum. Pollinia 6.

MINDANAO, Province of Agusan, west slope of Mt. Hilonghilong, alt. 400 m, March 27, 1911, *C. M. Weber 88.*

Appendicula Weberi in habit resembles *A. effusa* Schlechter, but is larger and apparently a much freer growing species with conspicuously elongated peduncles. In dried specimens the sepals have brilliant purple midveins.

4. **APPENDICULA (§ EU-APPENDICULA) WENZELII** sp. nov.

Herba epiphytica, ad truncus arborum, usque ad 50 cm alta, foliosa; caulis simplex. Folia disticha, oblongi-lanceolata, usque ad 4.5 cm longa, 12 mm lata, superne breviora. Foliorum vaginae sublaxae, supra paulo dilatatae, internodiis aequilongae. Inflorescentiae breves, usque ad 12 mm longae, flores albidi et purpurei, plus minus 5. Racemi quam folia breviores, terminales et laterales. Bracteae lineari-lanceolatae, usque ad 5 mm longae. Sepala lateralia triangularia, acuta, circiter 2 mm longa. Sepalum dorsale elliptico-ovatum, 2 mm longum, 1.25 mm latum. Petala rhombico-spathulata, acuta vel subobtusa, circiter 2 mm longa. Labellum subquadratum, vel supra medium late ovato-lanceolatum et prope medium constrictum; infra medium callo hippocrepiforme, permagno, ad basim subsaccatum. Rostellum breviter bifidum, anthera sagittata. Pollinia 6.

LEYTE, Dagami, 60 m above sea level, apparently preferring locations near running water, September 29, 1912, *C. A. Wenzel 10.*

Appendicula Wenzelii in habit resembles quite closely *A. Fenixii* (Ames) Schlechter, from which it is easily distinguishable by the structure of the labellum. The flowers are produced from the axils of the leaves, from near the base of the plant to the apex.

GLOMERA Blume

GLOMERA MERRILLII sp. nov.

Aff. *G. erythrosmae* Bl. Herba epithytica, ± 4 dm alta, flexuosa, foliosa. Caules circiter 5 mm in diametro. Folia disticha, lineari-lanceolata, coriacea, ± 10 cm longa, circiter 1 cm lata, articulata, ad basim in vaginis contracta. Vaginae circiter 2 cm longae, scabridae arcte adpressae. Inflorescentia terminalis, capitata. Flores albidi, conferti, bracteis numerosis intermixti. Bracteae inflorescentiae ± 12 mm longae, triangulari-lanceolatae, acuminatae, acutae. Sepala lateralia prope ad medium connata, mentum saccatum formantia, late falcata, oblongi-lanceolata, circiter 6 mm longa, plus minus 2.75 mm lata, ad apicem in caudam

filiformem, brevem, constricta. Mentum valde obtusum, circiter 3 mm longum. Sepalum dorsale lanceolatum, breviter apiculatum, 7 mm longum. Petala oblanceolata vel subspathulata, valde obtusa vel ad apicem rotundata, 5-nervia, 7 mm longa, circiter 2 mm lata. Labellum pedi columnae affixum, indivisum, ad apicem sacci dilatatum, pars superior subrotundata, 2 mm longa, 2 mm lata. Saccus 3 mm longus. Columna exalata, dilatata, fovea stigmatosa ampla. Pollinia 4, pyriformia. Anthera umbonata.

MINDANAO, District of Zamboanga, Sax River, *Merrill 8290*, November 27, 1911.

The genus *Glomera* has no other representative in the Philippines of which we have any knowledge. From *Agrostophyllum*, a genus with which *Glomera* might readily be confounded, it is separable by the number of pollen masses, *Agrostophylum* having 8 pollinia.

AGROSTOPHYLLUM Blume

1. AGROSTOPHYLLUM LONGIVAGINATUM sp. nov.

Aff. *A. longifolio* sed in habitu satis dissimilis. Planta ±4.5 dm alta, gracilis, foliosa, subflexuosa. Caules complanati vaginis foliorum tecti. Folia disticha, lineari-lanceolata, lamina 9–12 cm longa, circiter 9 mm lata, subcoriacea, acuta, vaginae foliorum imbricatae persistentes, flavidae, longivaginatae, circiter 6 cm longae. Flores albidi in capitulo terminali numerosi, bracteis imbricatis subtendentes. Sepala lateralia valde carinata, elliptico-lanceolata, acuta, 1-nervia, 4 mm longa, 2 mm lata, concaviuscula. Sepalum dorsale simile. Petala lineari-lanceolata, 1-nervia, 4 mm longa, prope basim 1 mm lata. Labellum saccatum, 3-lobatum; lobus terminalis subcordatus 2 mm longus, 2.5 mm latus, latior quam longior; lobi laterales minuti, erecti, obtusi. Columna exalata, crassa.

MINDORO, *Merrill 5656*. The specimens described flowered in Manila, October 4, 1911.

In one flower examined the lateral lobes were connected by a transversely situated membrane. In two other flowers this membrane was not present. That it may have been lost through injury is probable although the likelihood of such a membrane being evanescent should be taken under consideration.

2. AGROSTOPHYLLUM MEARNSII sp. nov.

Aff. *A. javanico* Bl. Caules ±4.5 dm alti, graciles. Folia disticha, coriacea, lineari-lanceolata ±8 cm longa, acuta, 7 mm lata, caulibus foliatis cum vaginis obtectis. Flores flavidi in capitulum terminale densissime conferti. Bracteae numerosae imbricatae. Sepala lateralia lanceolata, acuta, ad basim conca-

viuscula, 4 mm longa, 2.5 mm lata. Sepalum dorsale oblongi-ellipticum, ad apicem incrassatum. Petala linearia, 3 mm longa, circiter 1 mm lata. Labellum 4.5 mm longum, bisaccatum, vel ad medium valde constrictum, parte terminali valde concava, margine involuta; parte inferiore saccata, ad medium callus membranaceus. Columna elongata, 4 mm longa.

MINDANAO, Province of Misamis, Mt. Bliss, *For Bur. 4607 Major E. A. Mearns & W. I. Hutchinson*, May, 1906.

The flowers of *Agrostophyllum Mearnsii*, especially the constricted labellum, recall those of *A. javanicum* Bl., but the foliage is quite distinctive. I have seen material from Sumatra (*Schlechter 15967*) named *A. javanicum* Bl. by Dr. R. Schlechter which resembles *A. Mearnsii*, but which has longer, narrower leaves.

3. AGROSTOPHYLLUM PELORIOIDES sp. nov.

Herba epiphytica, circiter 4 dm alta, gracilis, caulibus foliatis cum vaginis obtectis. Folia elongata, subcoriacea, linearia, disticha, acuta, circiter 2 dm longa, circiter 8 mm lata. Vaginae imbricatae, superne liberatae, valde complanatae. Flores numerosissimi in capitulum terminale, sessile, nutans, densissime conferti. Sepala lateralia lanceolata, acuminata, acuta, ad apicem incrassata, 6.5 mm longa, 3.5 mm lata, mentum brevem formantia. Sepalum dorsale simile. Petala lanceolata, 6 mm longa, circiter 3 mm lata. Labellum elliptico-lanceolatum, 6 mm longum, 3 mm latum, concaviusculum, ad apicem breviter conduplicatum, incrassatum, in disco leviter carinatum. Columna 3 mm longa. Pollinia 8.

MINDANAO, District of Davao, Mt. Apo, *E. B. Copeland 1119*, April 21, 1904.

Agrostophyllum pelorioides is easily distinguishable from all other Philippine species, of which we have any record, by the labellum and broad petals. The labellum is similar to the petals in form and size and is scarcely saccate.

CERATOSTYLIS Blume

CERATOSTYLIS WENZELII sp. nov.

Herba epiphytica, caespitosa, circiter 3 dm alta. Pseudobulbi vel caules graciles, circiter 2.5 cm longi, monophylli, vaginis imbricatis appressis clathratim nervosis tecti. Folium lineari-lanceolatum, acutum, coriaceum, 1–2 cm longum, usque ad 1.7 cm latum, in petiolum sulcatum contractum. Vaginae 1.5–5 cm longae, scariosae, pulcherrime reticulatae. Flores 2 vel 3, succedanei, eodem tempore 1 vel 2 aperti. Pedicelli graciles cum ovario 8 mm longi. Ovarium lanugine albida dense vestitum. Bractea floris scariosa, triangulari-ovata, acuta. Sepala extus lanuginosa. Sepala lateralia oblonga, mentum obtusum elongatum for-

mantia, 1 cm longa, 2.5 mm lata. Sepalum dorsale simile, obtusum, 8 mm longum. Mentum cylindraceum, lanugine albida dense vestitum, 8–9 mm longum. Petala lanceolata, valde acuminata, acuta, usque ad 6 mm longa, purpurea. Labellum lineari-oblanceolatum, 13.5 mm longum, prope apicem constrictum et incrassatum, ecallosum, pedi columnae effixum. Columna basi in pedem longiusculum producta.

LEYTE, Dagami, *C. A. Wenzel 13*, December 10, 1912, on trees, 60 m above sea level, flowers white and purple.

In habit *Ceratostylis Wenzelii* resembles *C. radiata* J. J. Smith rather closely but is clearly distinct from that species in the details of the flower. The sepals and lip in dried specimens appear to have been white, the petals purple.

PHAIUS Loureiro

PHAIUS PHILIPPINENSIS N. E. Brown.

The material which I have referred to this species agrees very well with the description of *P. philippinensis*. I have seen no authentic specimens of Brown's plant.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 11139 McGregor*, March-April, 1912. "Petals white outside, light ochre-brown streaked with pink or carmine inside, the large lower petal (lip) rich carmine inside and on the border inside. In mossy bogs."

CALANTHE R. Brown

1. CALANTHE DAVAENSIS sp. nov.

Herba terrestris. Radices crassae. Pseudobulbi subnulli, tumidi, vaginis nervosis obtecti. Folia circiter 3, longe petiolata, lanceolata vel oblongi-elliptica, subtus breviter pilosa, acuminata, acuta, lamina circiter 2.4 dm longa, usque ad 6 cm lata, chartacea, prominente 5-nervia. Petiolus plus minus 2 dm longus, ad basim vaginatus, sulcatus, in sicco nervosus, erectus, gracilis. Pedunculus elongatus, foliis longior, circiter 10 dm longus, tomentosus, 6 mm in diametro prope basim. Bracteae lanceolatae, persistentes, 5–15 mm longae, pilosae. Racemus elongatus, laxus, ±2 dm longus. Flores albidi, pedicelli circiter 1.5 cm longi, graciles, pubescentes. Sepala lateralia elliptica, subapiculata, 3-nervia, 8 mm longa, 5–6 mm lata. Sepalum dorsale simile, ellipticum, circiter 9 mm longum, 3-nervium. Petala oblanceolata, subacuta, prope basim cuneata, 3-nervia, 8 mm longa, 3.5 mm lata. Labellum 3-lobatum, orbiculare; lobi laterales lobo terminali majores, cuneati, rotundati, nervosi, 5 mm longi, 6 mm lati; lobus medius cuneatus, bifidus, circiter 5 mm longus, 5 mm latus. Columna crassa, in disco labelli usque ad medium decurrens, utroque dentes duo vel tres formans. Calcar breve, 4 mm longum, circiter 1 mm in diametro.

MINDANAO, District of Davao, Mt. Apo, *E. B. Copeland s. n.*, October 25, 1904, terrestrial at 1,900 m altitude above sea level.

In outline the labellum is orbicular as the lateral lobes envelop the middle one. The divisions are cuneate, rounded and radiate from the tube formed by the union of the column and the base of the lip. The column is fleshy and in front passes obliquely into a dentate crest on the disc of the lip on each side.

2. **CALANTHE HENNISII** A. Loher in Gard. Chron. 46 (1909) 34.

LUZON, Province of Tayabas, *Bur. Sci. 13111, F. W. Foxworthy & M. Ramos,* March 8, 1911; without locality, *W. S. Lyon 41,* 1908, epiphyte, trees over stream at about 300 m altitude above sea level, flowering in January, sepals greenish-white, petals pure white, base of labellum bright lemon-yellow.

DENDROBIUM Swartz

1. **DENDROBIUM (§ STRONGYLE) MINDANAENSE** sp. nov.

Herba epiphytica usque ad 40 cm alta, gracilis, foliosa, flexuosa, prope apicem aphylla. Caules leviter fractiflexi, internodiis circiter 1 cm longis. Folia subteretia, circiter 1.8 cm longa, acuta, in sicco circiter 2 mm crassa, carnosa, leviter ascendentia. Flores circiter 1 cm longi, penduli, solitarii. Sepalum dorsale oblongum, 3 mm longum, circiter 3 mm latum, 3-nervium, lateralia antice triangula, obtuse acuta, postice in mentum 7 mm longum, antice apertum, leviter curvatum, elongata. Petala obtusa, linearioblonga, uninervia, 2.5 mm longa, 1 mm lata. Labellum simplex, usque ad 1 cm longum, e basi anguste dilatatum, cuneatum, antice retusum, lineae in disco 3 mox evanidae.

MINDANAO, District of Zamboanga, For. Bur. *13532 Foxworthy, Demesa, & Villamil,* June 15, 1912.

Nearly related to *Dendrobium uncatum* Lindl. which has much larger flowers, shorter leaves and a slightly different labellum. The three lines on the disc appear to terminate 1.5 mm from the apex of the labellum in an obscurely 3-lobed callus. The flowers are described as pale mauve with purple markings.

2. **DENDROBIUM (§ GRASTIDIUM) PERGRACILE** sp. nov.

Herba epithytica. Caulis tenuis, gracillimus, 30–60 cm altus, 1–2 mm crassus. Foliorum vaginae 2–3 cm longae, minutissime granulosae, internodiis aequilongae. Folia linearia, usque ad 13 cm longa, 4–5 mm lata, herbacea, acuminatissima. Racemi media e vagina foliorum orientes brevissime, biflori, squamae 2 cartilaginae in basi. Pedicellus cum ovario circiter 4 mm longus, gracilis. Sepala lateralia lineari-lanceolata in caudam subfiliformem producta, mentum brevem formantia, pars anterior 11 mm longa, prope gynostemium vix 2 mm lata; mentum vix 2 mm longum. Sepalum dorsale lineari-lanceolatum, vel lineari-triangulare, acuminatissimum, acutum, 8 mm longum. Petala linearia, in caudam filiformem producta, 11 mm longa, vix 1 mm lata.

Labellum 3-lobatum, 5 mm longum; lobi laterales falcati vel leviter curvati, oblongi, obtusi, 2 mm longi, vix 1 mm lati, integerrimi; lobus medius triangularis, acuminatissimus, 3 mm longus, prope basim 2 mm latus, intus pilosus, margine fimbriato, linea mediana incrassata. Gynostemium generis.

MINDANAO: Lake Lanao, Camp Keithley, *Mary Strong Clemens 999*, March 1907. Flowers white.

Dendrobium pergracile is closely related to *D. acuminatissimum* (Bl.) Lindl. from which it is easily separated by its smaller flowers.

3. **DENDROBIUM PHILIPPINENSE** sp. nov.

Herba epithytica, 20–40 cm alta, pergracilis, foliis acicularibus. Caules graciles, sursum teretes, internodiis prope basim angulatis, incrassatis, sive internodia inferiora fusiformia. Internodii 1–4 cm longi, prope basim 3 mm in diametro, superne circiter 1 mm in diametro. Foliorum vaginae cylindraceae, internodiis aequilongae. Folia teretia, acicularia vel subulata, vel filiformia, ascendentia, usque ad 10 cm longa, vix 1 mm in diametro, acuta. Flores flavidi, singuli, bracteae minutissimae. Pedicellus cum ovario circiter 9 mm longus, gracilis. Sepala lateralia antice triangula, acuta, postice in mentum leviter incurvum producta, pars anterior 5 mm longa, 3 mm lata, mentum circiter 6 mm longum, obtusum. Sepalum dorsale 4 mm longum, lanceolatum, acutum, 3-nervium. Petala lineari-lanceolata, acuta, 4.5 mm longa, 1 mm lata. Labellum simplex, 1 cm longum, prope apicem 4.5 mm latum, breviter unguiculatum, oblongum, rotundato-apiculatum ad apicem, in disco carinae duo.

LEYTE, Dagami, *C. A. Wenzel 6*, November 20, 1912.

In habit similar to *Dendrobium aciculare* Lindl. from which species it is clearly separable by means of the simple labellum. The labellum of *D. aciculare* is three lobed, with three raised lines on the disc.

I refer here also the following specimens:

LUZON: Laguna Province, *Bur. Sci. 5641 Griffin*, July–Dec., 1909; without exact locality, *W. S. Lyon 67*, June 1908 (in herb. Ames); *A. Loher 6022*, July 9, 1905 (specimen flowering in Manila). MINDORO, *Merrill 5658* (specimen flowering in Manila).

In habit *D. philippinense* also resembles closely *D. polytrichum* Ames, from which it is at once distinguishable by means of the very different labellum.

The United States National Herbarium contains a specimen (*Loher 487*), without flowers, which appears to be closely related to if not identical with *D. philippinense*. This specimen is a duplicate of material which Kränzlin in his monograph referred to *D. aciculare* Lindl.

Dendrobium Gerlandianum Kränzlin (a species which I have not seen) from the description is a nearly related species.

4. DENDROBIUM (§ CRUMENATA) ROBINSONII sp. nov.

Herba epiphytica, ±40 cm alta, foliis teretibus. Caules flaccidi, superne ramosi, internodia 3–4 inferiora incrassata, angulata, pseudobulbum fusiformem usque ad 11 cm longum formantia, cetera teretia. Folia teretia, acuta, ascendentia, usque ad 7.5 cm longa, in sicco circiter 2 mm in diametro. Flores in apice caulis singuli, flavidi, purpureo-striati, ±19 mm longi; bracteae in sicco chartaceae, circiter 2 mm longae. Pedicellus pergracilis, cum ovario 11 mm longus, ascendens, glabrus. Sepala lateralia antice elongato-triangula, obtusa, 5-nervia, postice in mentum obtusum leviter incurvum elongata, pars anterior 9–10 mm longa, 4 mm lata, mentum antice usque ad basim apertum 9 mm longum. Sepalum dorsale oblongum, valde obtusum, 1 cm longum. Petala oblongi-oblanceolata, acuta, 3-nervia, nerviis ramosis, 1 cm longa, vix 3 mm lata. Labellum circiter 1.5 cm longum, valde retusum, margine prope apicem irregulariter dentato, vix 3-lobatum sed subpanduriforme, breviter unguiculatum, prope basim cuneatum, in disco ad medium cristatum, lineae elevatulae per discum 3.

MINDORO, Bulalacao, *Bur. Sci. 5642 Robinson* (flowering in Manila), December, 1909. "Flowers pale greenish-yellow, throat with purple lines on the side, lip with a dark-purple blotch at base."

A very distinct species of the § *Crumenata*, characterized by the swollen base of the stem and the fleshy terete leaves.

5. DENDROBIUM (§ PEDILONUM) VANOVERBERGHII sp. nov. (Plate XIII.)

Habitu *D. furcato* Reinw. haud dissimilis. Caules graciles, pauciramosi, vix 2 mm in crassitudine, circiter 4.5 dm alti, suberecti, multiarticulati, nodii nigro-maculati. Folia linearilanceolata, acuta, subcoriacea, circiter 6.5 cm longa, 2.5 mm lata, disticha. Racemi pauciflori. Bracteae coloratae. Flores circiter 4.5 cm longi, praeclari; sepala petalaque subalbida, labellum purpureum. Sepala lateralia oblonga in mentum subacutum producta, 3.5 cm longa, 11 mm lata; mentum 1.5 cm longum. Sepalum dorsale oblongi-lanceolatum, obtusum, circiter 3.2 cm longum, 1.2 cm latum. Petala ovato-oblanceolata, obtusa, circiter 3 cm longa, 1.5 cm lata. Labellum longiunguiculatum, margine antice minute crenulato, supra medium dilatatum, lamina late ovata, 2.5 cm longa, 2 cm lata, obtusa. Labelli unguis linearis 2 cm longus in mento sepalorum lateralium absconditus. Gynostemium utrinque lobulatum.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 1345*, July 19, 1911.

Dendrobium Vanoverberghii, from the material I have examined, appears to be but slightly variable. The flowers of dried specimens indicate that the sepals and petals in a fresh state may have been whitish, the labellum purplish. The mentum may also show a purplish color in fresh specimens. *D. Vanoverberghii* is a member of the section or subgenus *Pedilonum*.

6. DENDROBIUM (§ GRASTIDIUM) VERRUCULOSUM sp. nov.

Caules elongati, teretes, ± 40 cm alti, verisimiliter plus quam 50 cm alti, circiter 2 mm in diametro. Folia patentissima, lineari-lanceolata, inaequaliter obtuse 2-dentata, 7–9 cm longa, 5–8 mm lata, basi rotundata, sensim longe acuminata, vaginae verruculosae internodiis aequilongae. Internodii circiter 1 cm longi. Inflorescentiae 2-florae. Flores mediocres, 2 cm lati. Racemi media e vagina foliorum orientes, brevissime. Pedicellus cum ovario plus minus 11 mm longus, gracilis. Sepala lateralia oblique triangula, elongata, acuminatissima, 9 mm longa, mentum 4 mm longum, valde obtusum, formantia. Sepalum dorsale oblongi-lanceolatum, acuminatissimum, superne paulo incrassatum, 9 mm longum. Petala linearia, acuminata, circiter 8 mm longa, prope basim vix 1 mm lata. Labellum 3-lobatum, breviter unguiculatum, 8 mm longum, lineae per discum 3, elevatae, irregulariter dentatae; lobi laterales obtusi, lobus medius vix 4 mm longus, 2.5 mm latus, erosus, oblongi-lanceolatus, acuminatus, acutus. Gynostemium generis.

Philippine Islands, *W. S. Lyon 143*, 1909. (Probably from Luzon.)

Closely related to *D. ornithoflorum* Ames. From *D. luzonense*, a closely allied species it is easily separated by the three, elevated, irregularly dentate keels which are conspicuous on the middle lobe and which become confluent opposite the lateral lobes where they form a thickened ridge. The sheathing bases of the leaves in dried specimens are longitudinally nerved with minutely verruculose nerves.

SARCOPODIUM Lindley

SARCOPODIUM STELLA-SYLVAE Loher & Kränzlin in Fedde Repert. 7 (1909) 40.

This interesting plant, which appears to be a diminutive form of *Sarcopodium acuminatum* Rolfe, is a native of Luzon. In the Herbarium of the Bureau of Science there is a specimen which agrees well with the original description of *Sarcopodium stella-silvae* and which resembles closely the illustration in Kränzlin's monograph of the *Dendrobiinae* in Engler's Pflanzenreich. The leaves are longer than those described from the type, being, in the specimens before me, about 5 cm long by 2 cm broad. The flowers are about as large as those of *D. acuminatum*, white, with a yellow and brownish labellum.

LUZON, Bontoc Subprovince, 1,750 m, above sea level, epiphyte, January 11, 1913, *Father M. Vanoverbergh 2418*.

ERIA Lindley

1. ERIA BONTOCENSIS sp. nov.

Herba epiphytica, usque ad 3 dm alta. Caules cylindracei, elongati, in sicco circiter 8 mm in diametro, ad summum foliosi. Folia oblongi-lanceolata, acuminata, acuta, lamina coriacea, usque ad 15 cm longa, 11–25 mm lata, in sicco nervosa. Inflorescentiae 3 vel 4, oppositifoliae, laxiflorae, circiter 1.5 dm longae, glabrae. Bracteae lanceolatae 5 mm longae, in sicco scariosae. Flores circiter 13 mm longi. Pedicelli glabri. Sepala et petala flavida, labellum purpureum. Sepala petalaque oblonga, 3-nervia, acuminata, subacuta, 12–13 mm longa, 2–3 mm lata. Labellum brevissime unguiculatum, 4 mm longum, 2 mm latum, simplex, ovatum, obtusum, 3-nervium, margine denticulato; calli prope basim labelli, carinati, prominentes. Columna crassa; pes 2 mm longus.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 1886*, June 24, 1911.

Eria bontocensis is nearly related to *E. philippinensis* and *E. Elmeri*. The elongated, narrow sepals and petals and the very prominent calli at the base of the labellum, one on each lateral vein, and the elongated stems are diffentiating characters, while from *E. philippinensis* the smooth flower stalks are quite serviceable for purpose of separation. In the flowers examined the labellum is minutely denticulate on the margin.

2. ERIA LEYTENSIS sp. nov.

Herba epithytica circiter 40 cm alta, foliosa. Caulis aliquid gracilis, internodiis 1–3 cm longis, circiter 4 mm in diametro. Foliorum vaginae arcte adpressae cylindraceae, supra paulo dilatatae, internodiis aquilongae, hirsutae, pilis sparsis, albidis, superne pilis densis rufis; laminae lineari-lanceolatae, acuminatae, acutae, coriaceae, rigidae in sicco, glabrae, valde rugosae in sicco, 5–8.5 cm longae, 6–10 mm latae. Inflorescentae breves, 3–4 cm longae, pilis rufis vestitae, racemi quam folia brevores, pauciflori. Bracteae dense villosae, valde coriaceae, late ovatae, subacutae, circiter 9 mm longae, intus glabrae. Pedicellus brevis, cum ovario 5 mm longus, pilis rufis. Flores circiter 1 cm longi. Sepalum dorsale oblongi-ellipticum, circiter 1 cm longum, extus villosum. Sepala lateralia oblongi-triangularia, extus apud apicem carinata, hirsuta, circiter 1 cm longa, acuta. Petala linearia, paulo spathulata, obtusa, 9 mm longa, 2.5 mm lata. Labellum usque ad 12 mm longum (8.5 mm ad apices loborum lateralium), intus pubescens, unguiculato-cuneatum, prope apicem 3-lobatum, lobis lateralibus minutis; lobus medius subreni-

formis, retusus, 8 mm latus, margine crenulato. In disco utrinque callus carinatus circiter 2 mm longus. Mentum 5 mm longum.

LEYTE, Dagami, *C. A. Wenzel 17*, December 2, 1912, 60 m altitude. "Flowers white, orange-yellow, and pink."

Eria leytensis is closely allied to *E. odorifera* Leavitt and *E. binabayensis* Ames. From the former it differs widely in the foliage and in having two carinate calli on the disc of the labellum. From the latter it differs chiefly in the foliage and is more rigid and compact. In the details of the flower it closely resembles *E. binabayensis*, both species having bicarinate labella. In the specimens examined only five pairs of leaves are present, the lower pairs having fallen away. That part of the plant which is still leafy rarely exceeds 1.5 dm in length, consequently a very characteristic aspect is presented.

3. ERIA WENZELII sp. nov.

Herba epithytica, 40 cm alta, foliosa. Caulis simplex, internodiis ±2.5 cm longis. Folia prope summun caudem conferta. Foliorum vaginae cylindraceae, laxae, supra paulo dilatatae, internodiis aequilongae, glabrae: laminae crassae, ±8 mm longae, in sicco 1.2 mm latae, valde coriaceae, rigidae, semi-teretes, sulcatae, valde acutae, ascendentes. Inflorescentiae oppositifoliae circiter 2 cm longae, pedunculo breve, uniflorae. Bracteae 4 vel 5, conspicuae, lineari-lanceolatae, acutae, glabrae, usque ad 12 mm longae, circiter 2.5 mm latae, erectae vel dependentes. Flos albidus circiter 11 mm longus, conspicuus, prope summum caulem ortus; pedicellus glabrus cum ovario 1 cm longus. Sepala lateralia 10–11 mm longa, lanceolata, subfalcata, acuta, mentum brevem formantia. Sepalum dorsale oblongum, obtusum vel subacutum, circiter 11 mm longum, usque ad 4.5 mm latum. Petala ovato-lanceolata, obtusa, membranacea, inaequaliter crenulata, 11 mm longa, circiter 5 mm lata. Labellum, basi breviter unguiculato, 3-lobatum, 7–8 mm longum, suborbiculare, 7 mm latum. Lobi laterales valde obtusi, incurvi vel subfalcati, 2 mm longi, 2.5 mm lati. Lobus medius incrassatus, subquadratus, valde obtusus, margine subcrispato, calli vel carinae 3, in disco carina valde incrassata, elevata; prope sinus loborum, calli duo, complanati, obtusi, subdentiformes, prope basim labelli tuberculum. Gynostemium crassum in pedem 3 mm longum productum. Mentum 4 mm longum.

LEYTE, Dagami, *C. A. Wenzel 19*, December 10, 1912, 60 m above sea level.

Eria Wenzelii in general aspect resembles *E. fastigatifolia*. In the characters of the inflorescence it is nearer **Eria bracteolata** (Kränzl.) (*Trichotosia bracteolata* Kränzl. in Engl. Bot. Jahrb. 44 Beibl. 101: 25), from which it differs in the structure of the labellum.

BULBOPHYLLUM Thouars

1. BULBOPHYLLUM (§ SESTOCHILOS) AEOLIUM sp. nov.

Rhizoma longe repens. Pseudobulbi erecti, cylindracei, in sicco valde rugosi, usque ad 7 cm longi, in sicco ±7 mm in crassitudine, ±12 cm distantes, leviter fastigati, juniores vagina permagna inclusi, monophylli. Folium coriaceum in sicco subchartaceum, elliptico-oblongum, acutum, plurinervium, nerviis transversaliis innumeris, cum petiolo circiter 27 cm longum, 6–7 cm latum. Petiolus sulcatus, circiter 2 cm longus. Scapus folio brevior, circiter 12 cm longus, erectus, paucibracteatus, bracteis infundibuliformibus ±1 cm longis. Flores 4 vel 5, conferti, racemo in umbellam constricto, speciosi. Bracteae inflorescentiae lanceolatae, confertae, circiter 1 cm longae, 5 mm latae, virides, pedicello multo breviores. Pedicellus cum ovario circiter 2.5 cm longus, arcuatus, glabrus, in sicco circiter 1 mm in diametro. Sepala petalaque vix patentia. Sepala lateralia 2.3–3 cm longa, usque ad 11 mm lata, falcata, triangulari-lanceolata, sensim longe acuminata, acuta, prope apicem leviter carinata, conduplicata. Sepalum dorsale circiter 3 cm longum, oblongi-lanceolatum, sensim acuminatum, acutum. Petala sepalis multo breviora, 1.4 cm longa, circiter 8 mm lata, triangulari-lanceolata, abrupte acuminata, valde acuta. Labellum 8–10 mm longum, supra medium valde deflexum, infra medium orbiculare, explanatum fere 1 cm latum, prope apicem conduplicatum, carinatum, ad basim profunde cordatum. Pes columnae 12 mm longus, valde elongatus, obcuneatus, prope basim labelli fastigatus et attenuatus, lineae tres paulum elevatae. Columna crassa, antice auriculis obtusis.

LEYTE, Dagami, *Bur. Sci. 15391 Ramos*, August, 1912. LUZON, Rizal Province, near Antipolo, *Juan Reillo* (*Hb. Ames 15223*), July, 1912.

In general habit similar to *Bulbophyllum uniflorum* Hassk. The color of the flowers was not recorded by the collector but in dried specimens appears to have been yellowish-brown or yellow tinged with red. The flowers in general aspect recall *B. Cheiri* Lindl. but are smaller and are borne in umbel like clusters, suggesting § *Cirrhopetalum*.

2. BULBOPHYLLUM DISSOLUTUM sp. nov.

Rhizoma elongatum, longe repens, circiter 1 mm in diametro. Pseudobulbi oblique depressi, cylindracei vel anguste pyriformes, superne paulatim fastigati, in sicco valde rugosi (tetragoni?) 13–16 mm longi, prope basim circiter 5 mm in diametro, remoti, *10–15 cm distantes*, raro 5 cm distantes, monophylli. Folium oblongi-ellipticum, ad apicem aequaliter obtuse 2-dentatum, coriaceum, prope basim attenuatum, vix petiolatum, 3–4.2 cm longum,

7–9 mm latum. Scapi foliis breviores, graciles, subfiliformes, erecti, vel ascendentes, ±3.7 cm longi, a basi pseudobulbi et a rhizomate inter pseudobulbos orti, uniflori, ad basim bracteis tubularibus. Flores purpurei, in sicco atro-purpurei. Pedicellus cum ovario circiter 7 mm longus, gracilis, bractea infundibulformi ad basim. Sepala lateralia oblongi-elliptica, obtusa, ±7-nervia, 6 mm longa, circiter 3 mm lata, mentum obtusum formantia. Sepalum dorsale ellipticum, obtusum ±7-nervium, 6 mm longum, 5 mm latum. Petala sepalis multo breviora, triangularia, attenuata, obtusa, uninervia, margine eroso, 3 mm longa, circiter 1.25 mm lata. Labellum 3.5 mm longum, crassum, lingulatum, obtusum, vix trilobum, lobis lateralibus rotundatis, erectis, ad basim minute bituberculatum vel utrinque callo papilliformi. Columna brevis, antice utrinque aristata.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 15069 Ramos,* June 13, 1912.

One of the most noticeable characteristics of this very distinct species is the great distance by which the pseudobulbs are separated on the elongated rhizome. Near the growing point of the rhizome the bulbs are closer together than on the maturer portions.

3. **BULBOPHYLLUM FENIXII** sp. nov.

Herba epithytica, compacta. Radices numerosae, graciles. Pseudobulbi conferti, ±1 cm distantes, pyriformes, rugosi, depressi, saepe curvati, in sicco saepe cylindracei, superne paulatim fastigati, 4–7 mm longi, circiter 4 mm in diametro prope basim. Folium oblongi-ellipticum, coriaceum, acutum, vix petiolatum, usque ad 3 cm longum, circiter 1 cm latum. Scapi filiformes, graciles, folio longiores, erecti, ±5 cm longi, uniflori. Flores flavidi. Pedicellus cum ovario circiter 9 mm longus, gracilis, curvatus, sepalis longior. Sepala lateralia anguste elliptica, 3-nervia, glabra, 6 mm longa, circiter 3 mm lata, obtusa vel subacuta, petalis multo longiora. Sepalum dorsale simile, circiter 5 mm longum, 3-nervium, acutum. Petala uninervia circiter 3 mm longa, oblongi-lanceolata, subacuta. Labellum lingulatum, obtusum, 3-nervium, glabrum, petalis longius, sepalis brevius. Columna utrinque longe aristata.

BABUYANES ISLANDS, Camiguin, *Bur. Sci. 4138 Fénix,* July 16, 1907.

4. **BULBOPHYLLUM MEARNSII** nom. nov.

Bulbophyllum carinatum Ames in Philip. Journ. Sci. 7 (1912) Bot. 140, non Cogn.

5. **BULBOPHYLLUM (§ MONANTHAPARVA) PERAMOENUM** sp. nov.

Herba epiphytica. Rhizoma elongatum, pergracile, vix 0.5 mm in diametro, ad nodos radicans. Pseudobulbi pyriformes, valde rugosi, remoti, 1–2 cm distantes, circiter 5 mm alti, ad

basim 3 mm in diametro, oblique depressi vel erecti, saepe curvati, superne paulatim fastigati. Folium lineari-lanceolatum, usque ad 3 cm longum, 2–5 mm latum, coriaceum, ad apicem rotundatum, minute apiculatum, in sicco nervosum, ad basim attenuatum, vix petiolatum. Scapi filiformes, pergraciles, erecti, a basi pseudobulbi et a rhizomate inter pseubulbos orti, uniflori. Flores atropurpurei, circiter 5 mm longi. Pedicellus cum ovario circiter 2 mm longus. Sepala lateralia oblongi-triangularia vel oblonga, prope apicem sensim acuminata, valde acuta, 3-nervia, 5 mm longa, circiter 1.5 mm lata, ad basim mentum brevem formantia. Sepalum dorsale simile. Petala lanceolata sensim longe acuminata, subcaudata, 4 mm longa, uninervia, sepalis multo breviora. Labellum 2 mm longum, atropurpureum in sicco, 3-lobatum, cuneatum, ad basim leviter cordatum vel auriculatum; lobi laterales vix producti, rotundati, lobus medius 1 mm longus, circiter 0.5 mm latus, crassus, valde obtusus, minute papulosus. Per medium labellum carina longitudinalis, incrassata, fere ad apicem lobi medii producta. Columna erecta, antice, utrinque aristata.

MINDANAO, District of Zamboanga, Sax River, *Merrill 8271*, November 28, 1911.

Bulbophyllum peramoenum is closely related to *B. Toppingii*, from which it is to be distinguished by the auriculate or cordate base of the labellum, the elongated, thickened keel on the disc and by the color of the flowers. The flowers of *B. Toppingii* are yellowish.

6. BULBOPHYLLUM (§ RACEMOSAE) REILLOI sp. nov.

Rhizoma crassum. Pseudobulbi nulli vel minuti. Folium longipetiolatum, coriaceum, oblongum, utrinque attenuatum, in sicco nervosum, cum petiolo circiter 3 dm longum, 3.3–3.7 cm latum, sensim in petiolum contractum; lamina ad basim cuneata. Petiolus profunde sulcatus, rigidus, ±7 cm longus, prope basim teres. Scapus petiolo longitudine fere aequalis vel longior, densiflorus, erectus, bracteatus, bracteis complanatis imbricatis ±1 cm longis infra racemum. Scapus cum racemo usque ad 9 cm longus. Racemus vix 5 cm longus, flores albidi, ascendentes, circiter 5 mm longi. Bracteae inflorescentiae lanceolatae, acuminatae, acutae, circiter 3 mm longae, pedicellis longiores. Sepala lateralia vix patentia, mentum brevem obtusum formantia, oblongi-lanceolata, acuta, subfalcata, 3.5–4 mm longa. Sepalum dorsale concaviusculum, oblongum, obtusum, usque ad 4 mm longum, leviter carinatum. Petala oblongi-elliptica, conspicue uninervia, ad apicem carinata et incrassata. Labellum lingulatum, carnosum, obtusum 3 mm longum, supra medium convexum,

infra medium sulcatum, ad basim rotundatum et bicallosum. Calli breviter carinati. Columna antice bicuspidata.

LUZON, Laguna Province, *Juan Reillo 24* (*Hb. Ames 13240*), June 20, 1912.

The type consists of two leaves and two flower spikes apparently broken from the same rhizome. The pseudobulbs are reduced to mere swellings on the rhizome as in *Bulbophyllum dasypetalum* Rolfe. Unfortunately the flowers are not fully matured. *B. Reilloi* is distinct from all other species of the Philippines through its short flower shoots which hardly exceed in length the slender, rigid, erect petioles of the elongated, very coriaceous leaves.

7. **BULBOPHYLLUM (§ MONANTHAPARVA) TOPPINGII** sp. nov.

Rhizoma repens, elongatum. Pseudobulbi pyriformes, valde rugosi in sicco, 5–7 mm longi, superne attenuati, ad basim ±3 mm in diametro, 1–1.5 cm distantes, oblique depressi vel erecti. Folium oblongi-lanceolatum vel lineari-lanceolatum, sensim attenuatum, ad apicem apiculatum, 1.9–3 cm longum, 3.5–5 mm latum, in sicco vix coriaceum. Petiolus ±3 mm longus, sulcatus. Scapi filiformes bractea tubulari ad basim, 2–3 cm longi, erecti, a basi pseudobulbi et a rhizomate in medio inter pseudobulbos ortis, uniflori. Flores vix 5 mm longi (deflexi?). Sepala lateralia elongata, lineari-triangularia, 3-nervia, 4.75 mm longa, circiter 1 mm lata, sensim longe attenuata, valde acuta, mentum brevem formantia. Sepalum dorsale simile. Petala pergracilia, uninervia, lineari-lanceolata, sensim longe attenuata, in caudam filiformen elongata, 3.75 mm longa, circiter 5 mm lata, ad basim leviter rotundata. Labellum 2 mm longum, cuneatum, superne dilatatum, glabrum, deinde 3-lobatum, lobi laterales vix producti, rotundati, lobus medius triangularis, obtusus, incrassatus, 0.5 mm longus, minute et dense papulosus. Per medium labellum carina longitudinalis, gnomoni solari similis, prope basim orta. Columna brevis, antice utroque ad apicem processus setiformis.

LUZON, Benguet Subprovince, Sablan Trail, *D. Le Roy Topping s. n.*, January, 1909.

Bullbophyllum Toppingii is a near relative of *B. exile* Ames from which it differs in the form and general structure of the labellum. The labellum of *B. Toppingii* is smooth, cuneate near the base, near the apex truncate-apiculate, or three lobed with the lateral lobes hardly produced. The callus on the disc of the labellum might be described as triangular, long decurrent in front.

8. **BULBOPHYLLUM (SESTOCHILOS) WENZELII** sp. nov.

Rhizoma repens, crassum, circiter 3 mm in diametro, in sicco rugosum, abunde radicans, bracteatus, bracteis laxis tubularibus, dilatatis circiter 8 mm longis. Pseudobulbi oblique depressi,

saepicule erecti, curvati, in sicco valde rugosi, subcylindracei, superne fastigati, ±2 cm longi, ad basim circiter 8 mm in crassitudine, juniores vagina obtecti, monophylli. Folium oblongi-ellipticum, acutum, valde coriaceum, breviter petiolatum, utrinque attenuatum, lamina 8–11 cm longa, 1.8–2.3 cm lata, plurinervia. Petiolus sulcatus, vix 1 cm longus. Scapus erectus, uniflorus, folio multo brevior, 3–6 cm longus, bracteatus, bracteis subfoliaceis, 1 cm longis. Pedicellus cum ovario circiter 1 cm longus. Flores purpurei, flavidi et virides. Sepala lateralia petalaque vix patentia, sepalum dorsale erectum vel inclinatum. Sepala lateralia circiter 11 mm longa, 9 mm lata, mentum brevem obtusum formantia, late ovata, acuta, abrupte acuminata, crassa, ad apicem breviter et leviter carinata, purpurea et flavida. Sepalum dorsale oblongi-lanceolatum, 1.4 cm longum, circiter 6 mm latum, acutum, crassum, purpureum, 7-nervium. Petala oblongi-lanceolata, 11 mm longa, circiter 5 mm lata, acuta. Labellum carnosum, purpureum et flavidum, lingulatum, margine infra medium denticulato, apex labelli valde deflexus, incrassatus, flavidus, obtusus, subtus ad basim labelli utrinque callus carnosus, flavidus. Discus minute puberulus. Pes columnae valde elongatus, 1 cm longus, purpureus. Columna carnosa, antice, ad medium brachiis elongatis, 3 mm longis, ad apicem dilatatis, valde obtusis.

LEYTE: Dagami, *C. A. Wenzel s. n.*, September 30, 1912. Epiphyte, 60 m altitude (*Hb. Ames 13663*).

The collector described the flowers in his field notes as purple, yellow, and green, with a pronounced raspberry odor. In the above description the colors are given as seen in a dried flower which appeared to have lost very little of its coloring.

9. **BULBOPHYLLUM ZAMBALENSE** Ames in Philip. Journ. Sci. 7 (1912) Bot. 134.

The original description of this species was taken from a single specimen with very narrow leaves. Additional material from Bontoc Subprovince, unquestionably referable to *B. zambalense*, has leaves 8 cm long and 9 mm wide. The large, imbricating, scarious, sheath-like bracts at the base of the scape are quite characteristic, in some examples partially concealing the lowermost flower of the raceme. In fresh specimens the leaves must be very fleshy and rigid.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 2286*, January, 1913.

10. **BULBOPHYLLUM (§ CIRRHOPETALUM) ZAMBOANGENSE** sp. nov.

Herba epiphytica. Radices numerosae, fibrosae. Rhizoma repens, circiter 2 mm in diametro. Pseudobulbi conferti vel remoti, tetragoni, in sicco rugosi, 1.5–2 cm longi, obpyriformes, flavidi, prope apicem paulatim fastigati. Folium oblongi-ellip-

ticum, ad apicem minute inaequaliter obtuse bilobum, valde coriaceum, breviter petiolatum, rugosum in sicco, 4–6 cm longum, 12–20 mm latum, erectum. Scapus foliis multo longior, gracilis, lateralis, paucivaginatus, usque ad 1.5 cm longus, vaginis tubularibus. Bracteae inflorescentiae parvulae. Flores purpurei, racemo in umbellam contracto. Pedicelli graciles cum ovario 5–6 mm longi. Sepala lateralia usque ad apicem cohaerentia ad basim libera, oblonga, elongata, obtusa, 11–12 mm longa, margine exteriore valde revoluta. Sepalum dorsale valde dissimile, ovato-lanceolatum, in caudam filiformem contractum, circiter 9 mm longum, 2 mm latum, margine longe hirsuto et pubescente cetera puberulum. Petala lineari-lanceolata vel elongata, lineari-triangularia, margine pubescente et hirsuto, in caudam filiformem contracta, circiter 7 mm longa, 1-nervia. Labellum lingulatum, curvatum, 2 mm longum, subtus carinatum, prope basim bicallosum. Columna brevis, antice stelidia aristata. Anthera integerrima.

MINDANAO, Zamboanga, *For. Bur. 9165 Whitford & Hutchinson,* December 9, 1907, on tree trunks, altitude above sea level 20 m.

Bulbophyllum zamboangense is closely related to *B. Cumingii* Reichb. f. It is in part distinguishable by the smaller flowers.

THECOSTELE Reichenbach f.

THECOSTELE ELMERI comb. nov.

Pholidota Elmeri Ames in Elm. Leafl. Philip. Bot. 5 (1912) 1557.

Additional material from Leyte received from C. A. Wenzel convinces me that Elmer's specimens from Palawan (*Elmer 12971*) should be referred to *Thecostele.*

LEYTE, Dagami, on trees, 60 m above sea level, flower odorless, white and purple, *C. A. Wenzel 86,* November 10, 1912.

LUISIA Gaudichaud

LUISIA TERETIFOLIA Gaudich.

CAMIGUIN DE MINDANAO, *Bur. Sci. 14414 Ramos,* March–April, 1912.

PHALAENOPSIS Blume

PHALAENOPSIS MARIAE Burbidge.

This endemic species has been collected both in Luzon and Mindanao and is readily distinguished from *P. Lueddemanniana* by its many flowered elongated inflorescence. The scape equals or exceeds the leaves and the flowers are smaller than in *P. Lueddemanniana.* R. C. McGregor described the flowers of specimens gathered by him in Luzon as follows: "88 blossoms all open on one plant. Fl. stalk with 8 to 15 blossoms, petals pale-yellow with heavy spots tending to bars of burnt-carmine. Central part mostly violet-purple, upper part of center white with two dots of yellow."

LUZON, Province of Nueva Vizcaya, vicinity of Dupax, *Bur. Sci. 11136, 11141 McGregor,* March–April 1912. MINDANAO, Distrct of Davao, *A. Loher 6011,* determined by R. A. Rolfe.

SACCOLABIUM Blume

1. SACCOLABIUM CONFUSUM sp. nov.

Habitu *S. luzonensis* haud dissimilis a quo tamen floribus differt. Herba epiphytica. Radices fibrosae, copiosae, elongatae. Caulis abbreviatus, usque ad 3 cm longus, radicans. Folia disticha, oblongi-lanceolata, ad basim cuneata, attenuata, ad apicem inaequaliter et obtuse biloba, usque ad 7 cm longa, 1–1.3 cm lata, coriacea, conferta, vaginis persistentibus caulem obtegentibus. Pedunculi laterales foliis breviores, inferne teretes, superne complanati, alati, paucibracteati, bracteis tubularibus 1 mm longis. Flores in racemo laxo dispositi. Bracteae inflorescentiae rigidae, triangulari-cymbiformes, acutae, circiter 1 mm longae, pedicellis breviores. Pedicellus cum ovario circiter 7 mm longus, gracilis, glabrus. Sepala lateralia membranacea, oblanceolata, 1 cm longa, 3 mm lata, extra ad apicem cuspide minuta. Sepalum dorsale simile, subconformia. Petala spathulata, vel oblanceolata, obtusa, 1 cm longa, 2.75 mm lata, membranacea, usque ad basim attenuata, 3-nervia. Labellum crassum, abbreviatum, breviter saccatum, 6 mm longum, lobi laterales minuti, rotundati, subauriculiformes, lobus medius linguiformis, inflatus, circiter 6 mm longus, obtusus. Saccus obtusus, scrotiformis 2 mm longus, obtusus. Columna brevis, crassa, apoda, exalata. Pollinia 2, subglobosa.

LUZON, Laguna Province, *J. S. Serrato s. n.*, September, 1912.

This species and the next resemble each other so closely in habit that a study of the floral differences is necessary to make identification absolutely sure. Both species were mingled by the collector.

2. SACCOLABIUM LUZONENSE sp. nov.

Herba epiphytica, floribus albidis parvulis, caulibus foliatis abbreviatis erectis. Caulis circiter 1 cm longus, vaginis foliorum caulem obtegentibus. Folia ±5 cm longa, circiter 11 mm lata, inaequaliter lanceolata, saepe falcata, inaequaliter 2-dentata, coriacea, utrinque attenuata. Pedunculi laterales, simplices, glabri, paucibracteati. Flores mediocres, circiter 7 mm longi, in racemo laxo, paucifloro, dispositi. Sepala petalaque patentia, libera. Rhachis incrassatus, complanatus, bracteis carnosis triangulari-cymbiformibus, 1 mm longis, acutis, rigidis, distichis. Pedicellus cum ovario usque ad 11 mm longus, glabrus, gracilis, ascendens. Sepala lateralia oblonga, 7 mm longa, 2.5 mm lata, extra ad apicem cuspide minuta. Sepalum dorsale simile. Petala oblonga, acuta, 6.5 mm longa, circiter 2 mm lata, membranacea. Labellum 5–6 mm longum, trilobum, basi calcaratum, membranaceum. Lobus medius triangularis, margine irregula-

riter et inaequaliter dentato, acutus, ±3 mm longus, infra medium 2 mm latus, ecallosus; lobi laterales obtusi, rotundati, callosi. Calli carnosi, elevati, in auriculas crassas et obtusas ad basim labelli producti. Calcar cylindraceum, obtusum, vix ad apicem dilatatum, usque ad 7 mm longum, intus glabrum; discus ad os calcaris incrassatus. Columna brevis, crassa, apoda, exalata; pollinia 2, subglobosa, integra. Capsula elongata.

LUZON, Laguna Province, *J. S. Serrato, s. n.*, September, 1912.

The denticulate middle lobe suffices to distinguish this from the preceding species. Also the long cylindric spur is characteristic.

TAENIOPHYLLUM Blume

TAENIOPHYLLUM COPELANDII sp. nov.

Radices crassae, affluens, elongatae, 2 mm latae, glabrae, quaquaversae. Caules nulli. Scapi breves, pauciflori, erecti, circiter 1 cm longi, prope medium bractea infundibuliformi 1 mm longa. Flores albidi. Sepala lateralia 3 mm longa, 1.25 mm lata, oblonga, subacuta, uninervia. Sepalum dorsale simile, obtusum. Petala 3 mm longa, 1 mm lata, obtusa, oblonga, subspathulata, uninervia. Labellum saccatum integerrimum, antice lanceolatum, subacutum, 2 mm longum, callo cucullato prope apicem. Saccum 1.5 mm longum, obtusum, scrotiforme.

MINDANAO, District of Davao, *E. B. Copeland 339*, March 5, 1904.

Taeniophyllum Copelandii is a copiously rooting species, the roots forming a dense mat on the bark of trees. The scapes, several arising from each plant, are very short and from dried material appear to bear at most two, inconspicuous, white flowers, which persist on the elongated fusiform capsules. The sepals are free for the most part, the upper one appearing to be lightly adherent to the petals. The labellum is simple, strongly saccate, and in front produced into a lanceolate plate near the end of which is a minute callus which in dried specimens appears to have been cucullate, with its sides slightly decurrent on the disc of the labellum.

THRIXSPERMUM Loureiro

1. THRIXSPERMUM MINDANAENSE sp. nov.

Herba epiphytica, pusilla, usque ad apicem foliorum 4–8 cm alta. Caulis abbreviatus, foliatus, 1–1.5 cm. longus. Folia disticha, oblonga, falcata vel subfalcata, utrinque attenuata, inaequaliter biloba, lobis subacutis, 2–7.5 cm longa, vix 1 cm lata, in sicco nervosa, vaginis persistentibus caulem obtegentibus. Pedunculi hispiduli, laterales, foliis breviores, saepe longiores, graciles, usque ad 5.5 cm longi, paucibracteati. Racemi abbreviati rhachide incrassato. Bracteae inflorescentiae rigidae, vix 1 mm longae, squamiformes, pedicello breviores, acutae, conca-

viusculae. Pedicellus glabrus, cum ovario 5–6 mm longus, gracilis. Flores albescentes. Sepala lateralia circiter 3 mm longa vel usque ad 4 mm longa, vix 2 mm lata, inaequaliter lanceolata, ad basim cuneata, supra medium attenuata, acuta, ad apicem incrassata vel subtus subcarinata prope apicem, 3-nervia. Sepalum dorsale quam lateralia multo angustius, oblongi-lanceolatum, concaviusculum, circiter 3.5 mm longum, vix 1.5 mm latum. Petala cuneato-spathulata, obtusa, sensim angustata usque ad basim, 3.5–4 mm longa, circiter 1 mm lata. Labellum unguiculatum, protumidum, simile *Sarcochilo emarginato* Reichb. f.; lobi laterales erecti, oblongi, obtusi, 1.5 mm longi, vix 1 mm lati, membranacei: columna crassa, circiter 1 mm longa.

MINDANAO, Prov. Agusan, Butuan, *C. M. Weber 139*, June 3, 1911 (*Hb. Ames 12581*).

2. **THRIXSPERMUM PHILIPPINENSE** sp. nov.

Herba epiphytica. Caulis abbreviatus, usque ad 2.5 cm longus. Folia coriacea, 6.5–15 cm longa, 1.5–2 cm lata, articulata, oblonga, vel oblongi-lanceolata, ad apicem valde et inaequaliter biloba, utrinque attenuata, saepe falcata, disticha, conferta, ±7, vaginis persistentibus caulem obtegentibus. Pedunculi laterales foliis breviores, hispiduli, ±7 cm longi, gracili, erecti, paucibracteati, bracteis tubularibus, vix 2 mm longis, superne dilatati et complanati. Flores in racemo laxo paucifloro dispositi, circiter 2 cm longi. Bracteae inflorescentiae rigidae, pedicellis breviores. Pedicellus, cum ovario, gracilis, vix 1.5 cm longus. Sepala lateralia oblongi-lanceolata, acuta, 1 cm longa, 3.5 mm lata, ad basim mentum brevem formantia. Sepalum dorsale oblongi-ellipticum 1 cm longum vix 3 mm latum. Petala oblonga, obtusa, 9 mm longa, circiter 2 mm lata. Labellum pedi columnae affixum, protumidum, 3-lobatum; lobi laterales erecti, petaloidei, oblongi, obtusi, 4 mm longi, 1.5 mm lati, vix 2 mm lati, ad basim lobi utriusque lateralis in margine interiore callus minutus vel papilla. Lobus medius dentiformis. Saccum protumidum 8 mm longum usque ad pedem columnae, obtusum, complanatum. Columna generis. Capsula elongata circiter 8 cm longa, in sicco ±2 mm in diametro.

LUZON, Laguna Province, *J. S. Serrato s. n.*, September, 1912. "Flowers whitish-yellow".

The general form of the flower, especially of the labellum recalls *Thrixspermum pallidum* which is a larger species.

From the material examined *T. philippinense* is rather common in Luzon. Outside of Luzon specimens from Mindanao, Mindoro and from the Island of Polillo have been identified.

3. **THRIXSPERMUM VANOVERBERGHII** sp. nov.

Herba epiphytica, carnosa, rigida. Caulis abbreviatus, ±2 cm longus, complanatus, foliosus. Folia disticha, conferta, coriacea, in sicco valde rugosa, 3–8 cm longa, ±1 cm lata, sensim angustata usque ad apicem, saepe falcata, lanceolata vel lineari-lanceolata, ad apicem inaequaliter 2-dentata, margine prope apicem irregulariter dentato (in sicco) vel crenulato, vaginis persistentibus caulem obtegentibus. Pedunculi laterales, graciles, glabri, non hispiduli, foliis longiores, 4–11 cm longi, 1- vel 2-bracteati. Rhachis inflorescentiae incrassatus, bracteis imbricantibus, confertis, triangulari-cymbiformibus, rigidis, acutis, patentibus. Flores succedanei, abidi et flavidi, membranacei. Pedicellus cum ovario ±4 mm longus, glabrus, bracteis multo longior. Sepala lateralia mentum obtusum formantia, usque ad 7 mm longa, ±4 mm lata, subelliptica, obtusa. Sepalum dorsale elliptico-lanceolatum, subacutum, circiter 7 mm longum, 4 mm latum, concaviusculum. Petala subspathulata, obtusa, 6 mm longa, vix 3 mm lata. Labellum circiter 5 mm longum, submembranaceum, cassidiforme, breviter unguiculatum, pedi columnae affixum, protumidum; lobi laterales rotundati, lobi utriusque lateralis in margine interiore callus erectus: lobus medius minutus vel obsoletus, antice intus appendicula comosa ascendente. Columna generis.

LUZON, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 1792*, November 10, 1912.

4. **THRIXSPERMUM AMPLEXICAULE** (Bl.) Reichb. f. Xen. Orch. 2:121.

This interesting plant which has been ascribed to the Philippines through Cuming's collection numbered 2056 belongs to a small group of species well characterized by the thickened rhachis of the inflorescence and the ephemeral flowers. The ovate-cordate leaves, which at their bases embrace the slender stems, are persistent, 2.5 cm apart. The flowers are white and deep-purple. The specimens collected by McGregor were found growing among grasses in bogs.

LUZON, Province of Nueva Vizcaya, vicinity of Dupax, *Bur. Sci. 11143*, *McGregor*, March, 1912.

CAMAROTIS Lindley

CAMAROTIS PHILIPPINENSIS Lindl. in Journ. Linn. Soc. Bot. 3 (1859) 37.

Sarcochilus philippinensis Vid. Rev. Pl. Vasc. Filip. (1886) 271.

The original description of this plant is so inadequate that a redescription may prove serviceable.

Plant epiphytic, 30–50 cm high. Stems rigid, concealed by the sheathing bases of the leaves, 6 mm thick, rooting. Leaves distichous, coriaceous, ligulate, unequally bilobed at the tip, obtuse, 13–15 cm long, about 2 cm wide, sheathing bases slightly

dilated above, 2.5–3 cm long. Peduncles to the tip of the raceme 17–20 cm long, arising from near the summit of the stem, ascending, with about four tubular bracts 4–5 mm long. Raceme loosely flowered, about 1 dm long with scale-like bracts subtending the flowers. Pedicels and ovary 1 cm long, slender. Flowers yellow, somewhat triangular in the bud. Lateral sepals oblong-spathulate, obtuse, deflexed, 9 mm long, 4 mm wide, fleshy. Upper sepal elliptic-oblong, obtuse. Petals oblong, obtuse, 8 mm long, about 3 mm wide. Labellum fleshy, rigid, 4 mm long, affixed to the base of the column, 3-lobed, subtriangular seen from the side, the lateral lobes forming the rounded apex of the triangle; middle lobe minute, fleshy, erect or slightly inflexed, thickened and obscurely round-toothed at the apex, about 1.5 mm long, lateral lobes rounded in front, fleshy but not so thick as the rest of the lip. At the apex the lip is divided dorsoventrally by a rigid membrane into two shallow compartments; on each side above the compartments a triangular fleshy pubescent callus is affixed to the lateral walls of the sac and these calli are connected by a ridge of elevated tissue which joins a longitudinal, abbreviated keel at the back, the distal end of which passes into the dividing wall of the apical compartments. Gynostemium fleshy, 3 mm long, produced into an elongated beak in front, 4 mm long.

LEYTE, Dagami, *C. A. Wenzel 4*, November 25, 1912.

The distinct septum of the labellum appears to be sufficient to place *Camarotis philippinensis* in *Sarcanthus*. Vidal placed this species in *Sarcochilus* but the internal structure of the labellum indicates close relationship with *Sarcanthus*.

The *Sarcanthinae-Aerideae* of Pfitzer constitutes a large and puzzling group of genera several of which may be merged or more liberally broken up as further studies are made on fresh or alcoholic material.

TRICHOGLOTTIS Blume

1. TRICHOGLOTTIS MINDANAENSIS sp. nov.

Herba epiphytica, caules graciles, ±60 cm alti, foliosi, internodiis 2.5 cm longis. Folia disticha, coriacea, anguste elliptica, vel oblongi-elliptica, ad apicem inaequaliter biloba, 5–7 cm longa, usque ad 2.7 cm lata, articulata. Foliorum vaginae cylindraceae vix complanatae, internodiis aequilongae, supra paulo dilatatae, rugosae in sicco. Inflorescentiae oppositifoliae. Flores 5, successanei, flavidi, purpureo-maculati, carnosi. Pedicellus cum ovario 1 cm longus. Sepala lateralia oblongi-elliptica, obtusa, deflexa, 7–8 mm longa, 3.5–4 mm lata. Sepalum dorsale oblanceolatum, obtusum, convexum, 8 mm longum, prope apicem 3 mm

latum, erectum. Petala spathulata vel oblanceolata, ad basim attenuata, 7.5 mm longa, ascendentia. Labellum 3-lobatum, breve saccatum, lobis lateralibus brevibus, oblongis, obtusis, 1 mm longis; lobo medio elliptico, obtuso, 4 mm longo, vix 3 mm lato. Ad basim lobi medii, in disco, appendix 2.5 mm longa, pilosiuscula, ad apicem bifurcata, ascendens. Gynostemium vix 3 mm longum, minute pubescens.

MINDANAO, District of Zamboanga, on tree overhanging a tidal stream, May 29, 1912, *For Bur. 13429, Foxworthy, Demesa & Villamil.*

A very distinct species, differing from all other members of the genus now known to be natives of the Philippines through the obliquely ascending bifurcate process which arises from the base of the middle lobe of the labellum. Between the lateral lobes of the labellum there are two calli, which in dried specimens are very difficult to understand. The middle lobe and side lobes of the labellum are smooth on both sides.

2. **TRICHOGLOTTIS WENZELII** sp. nov.

Herba epiphytica circiter 30 cm alta, rigida. Caules foliosi, internodiis 1.5–2 cm longis. Foliorum vaginae cylindraceae, supra paulo dilatatae, internodiis aequilongae, laminae valde coriaceae, in sicco rugosae, oblongae, 4.5–6 cm longae, circiter 1.5 cm latae, distichae, ad apicem subaequaliter rotundato-bilobae vel retusae. Inflorescentiae oppositifoliae, foliis breviores. Bracteae rigidae, 2 mm longae. Flores inter maximos generis, purpureo-maculati, circiter 2 cm in diametro. Sepala lateralia oblonga, subacuta, ad basim late cuneata, carnosa, 1 cm longa, 6 mm lata. Sepalum dorsale simile. Petala spathulata, 9–10 mm longa, prope apicem 3 mm lata. Labellum breve saccatum, 3-lobatum, lobis lateralibus brevibus, obtusis, utrinque pubescentibus, lobo medio elongato, attenuato, sagittato-lanceolato, apice attenuato, acuto, usque ad 13 mm longo, pubescenti. Callus in disco, pubescens. Ligula ante foveam pubescens 4 mm longa. Gynostemium pubescens auriculis elongatis, pilosis, 4 mm longis.

LEYTE, Dagami, on trees at a great height, 60 m above sea level, December 8, 1912, *C. A. Wenzel 15.*

Trichoglottis Wenzelii is a stiff plant with leathery, deeply retuse leaves which, in the specimens examined, are confined to the upper part of the stem at flowering time, the lower portion of the stem being sheathed by the persistent bases of fallen leaves. The flowers which are described as white, purple, green and yellow by the collector, in dried specimens are yellowish with purple dots and bands. The labellum is rough in dried material, densely glandular-hairy, with the lateral lobes much reduced, together forming a quadrate plate at the base of the sagittate-lanceolate middle lobe. In front of the lateral lobes at the base of the middle lobe is a small pubescent callus. The sac at the base of the lip is scarcely more than a depression. Disc in front of the middle lobe sulcate.

EXPLANATION OF THE PLATE

PLATE XIII

Dendrobium Vanoverberghii Ames. Photograph of a living plant in the possession of Dr. A. R. Ward, Manila. (Courtesy of the Bureau of Agriculture, Manila.)

PLATE XIII. DENDROBIUM VANOVERBERGHII AMES.

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ENUMERATIO SAPINDACEARUM PHILIPPINENSIUM NOVARUMQUE DESCRIPTIO

Auctore L. RADLKOFER

(*Munich, Bavaria, Germany*)

ABBREVIATIONES

R. in Elm. I = Radlkofer in Elmer Leaflets Philippine Botany I (1907) p. 208 sqq.
R. in Elm. V = Radlkofer in Elmer Leaflets Philippine Botany V (1913) p. 1601 sqq.
R. in Engl. & Pr. = Radlkofer in Engler & Prantl Natürl. Pflanzenfam. III, 5 (1895) p. 312 sqq.
R. in Fl. bras. = Radlkofer in v. Martius Flora brasiliensis XIII, 3 (Fasc. 124, 1890) p. 517 sqq.
R. in Perk. = Radlkofer in J. Perkins Fragm. Flor. Philippinae I (1904) p. 56 sqq.
R. in Ph. J. = Radlkofer in Philippine Journal of Science VI (1911) Botany p. 181 sqq.
R. in S. Holl.-I. = Radlkofer in Ueber die Sapindaceen Holländ.-Indiens, Extrait des Actes du Congrès à Amsterdam (1877) p. 1 sqq. Nachträge (1878) p. 65 sqq.
R. in Sitz. = Radlkofer in Sitzungsberichte der K. bayer. Acad., II. (math.-physik.) Classe, XXXVIII (1908) p. 226 sqq. Accedit VIII (1878) p. 299 sqq., XVI (1886) p. 404.
* = species (vel forma) nova, infra descripta.
(*) = species ex aliis terris nota, e Philippinis nondum vel non recte indicata (adjectis synonymis et collectionibus).

ENUMERATIO

CARDIOSPERMUM

Hallcacabum L.,

var. microcarpum (HBK.) Bl. Ins. Batanes, Luzon, Panay, Negros Bohol, Palawan.—Distrib.: Regiones tropicae et subtropicae totius orbis.

ALLOPHYLUS

*** largifolius** Radlk. infra n. 1. Mindanao.
unifoliolatus R. in Elm. I. p. 208. Leyte.
*** apiocarpus** R. infra n. 2. Cebu.
*** brevipetiolatus** R. infra n. 3. Panay.
*** peduncularis** R. infra n. 4. Ticao.
simplicifolius R. in Elm. V p. 1601. Mindanao.
*** hymenocalyx** R. infra n. 5. Mindanao.

racemosus (L.) R. in Engl. & Pr. p. 313, in Perk. p. 58. Luzon, Negros, Mindanao, Basilan, Palawan.—Distr.: Ins. sundaicae, moluccanae, Aru, N.-Guinea; Burma, penins. malaica, Indo-China.

ternatus (Forst.) R. in Engl. & Pr. p. 313, in Perk. p. 59. Luzon, Polillo, Panay, Mindanao, Basilan, Tawi Tawi.—Distr.: Timor, Celebes, Borneo, Moluccae, Carolinae, N.-Guinea, Neu-Hannover, ins. Charlottae, Novae Hebrides, N.-Caled., Australia boreali-orientalis.

* **granulatus** R. infra n. 6. Luzon.

(*) **javensis** Bl. Palawan (*A.* sp. Vidal in Catal. Herb., 1892, p. 52, coll. *n. 2470*)—Distr.: Peninsula et insulae malaicae.

setulosus R. in Perk. p. 59. Mindanao, Balut, Jolo.

leptococcus R. in S. Holl.- I. p. 56. Luzon.—Distr.: Ins. Key.

leucochrous R. (errore "leucocladus") in Ph. J. p. 181. Polillo.

dasythyrsus R. in Sitz. p. 231. Luzon.

malvaceus R. in Sitz. p. 231. Luzon.

filiger R. in S. Holl.- I. p. 56. Luzon.

macrostachys R. in Perk. p. 56. Luzon, Panay, Leyte.

grossedentatus (Turcz.) F.-Villar. Luzon.—Distr.:? Indo-China (teste Lecomte).

* **chlorocarpus** R. infra n. 7. Mindanao (?), Palawan.

timorensis (DC.) Bl. emend. R. in Perk. p. 59. Luzon, Alabat, Mindoro, Sibuyan, Masbate, Negros, Samar, Bohol, Ubian, Cavilli, Comiran, Mangsi.—Distr.: Archipelagus indicum, Papuasia, Micronesia (a Sumatra usque ad insulas Samoanas et N.-Caledon.).

leptocladus R. in Elm. V p. 1602. Mindanao.

subinciso-dentatus R. in Elm. V p. 1603. Mindanao.

repando-dentatus R. in Elm. V p. 1603. Mindanao.

dimorphus R. in S. Holl.- I. p. 56, in Perk. p. 56. Luzon.—Distr.: Indo-China.

quinatus R. in Perk. p. 57. Luzon.

insignis R. in Sitz. p. 234. Luzon, Palawan.

SAPINDUS

Saponaria L.,

f. 3. **microcarpus** (Jard.) R. in Fl. bras. p. 517, in Perk. p. 59. Luzon.—Distr.: Ins. Marquesas, Societatis, Pitcairn, Paschatis, Sandwicenses.

ERIOGLOSSUM

rubiginosum (Roxb.) Bl. Rumphia III, 1847, p. 118; R. in Perk. p. 60. Luzon, Mindoro, Sibuyan, Mabate, Panay, Mindanao, Basilan, Jolo, Palawan, Balabac.—Distr.: India orientalis, Indo-China, Archipelagus indicum, Australia septentrionali-occidentalis.

APHANIA

philippinensis R. in Perk. p. 60. Luzon, Jolo.

angustifolia R. in Elm. I. p. 209. Leyte.

* **Loheri** R. infra n. 8. Luzon.

HEBECOCCUS

* **inaequalis** R. infra n. 9. Cebu.

* **falcatus** R. infra n. 10. Luzon, Leyte.

LEPISANTHES

* **viridis** R. infra n. 11. Mindanao.
eriolepsis R. in S. Holl.-I. p. 36. Luzon.
schizolepis R. in S. Holl.-I. p. 87;
f. 1. **genuina** R. in Perk. p. 60. Babuyanes, Luzon.
f. 2. **sphenolepis** R. in Perk. p. 60. Luzon.
? **palawanica** R. in Elm. V p. 1604. Palawan.

OTOPHORA

fruticosa (Roxb.) Bl.; R. in Perk. p. 61. Luzon, Mindoro, Panay, Negros, Cebu, Mindanao, Palawan, Balabac.—Distr.: Java ?, Sumbava, Borneo, Celebes, Moluccae, Siam.
* **setigera** R. infra n. 12. Mindanao.
oliviformis R. in Ph. J. p. 181. Polillo.

TRISTIROPSIS

* **subfalcata** R. infra n. 13. Basilan.
* **oblonga** R. infra n. 14. Mindoro.
ovata R. in Elm. V p. 1605. Mindanao.

TRISTIRA

triptera (Blo.) R. in S. Holl.-I. p. 63. Luzon.
pubescens Merrill;
f. 1. **genuina** R. infra n. 15. Luzon;
f. 2. **hemidasya** R. infra n. 15. Luzon.

EUPHORIA

* **Longana** Lam. Luzon, culta in hort. (Coll. Merrill).—Distr.: China et culta in India orientali ac reliquis tropicis et subtropicis.
* **nephelioides** R. infra n. 16. Basilan.
* **foveolata** R. infra n. 17. Luzon.
gracilis R. in Elm. V p. 1606. Mindanao.
cinerea (Turcz.) R. in Sitz. VIII p. 299, in Perk. p. 61. Luzon, Mindoro, Mindanao, Malamaui.
stellulata (Turcz.) R. in Sitz. VIII p. 303. Samar, Mindanao.—Distr.: Borneo.

PSEUDONEPHELIUM

* **fumatum** (Bl.) R. in S. Holl.-I. p. 71. Luzon (Coll. W. Klemme n. *6647, 6657*).—Distr.: Borneo, Perak.

LITCHI

* **philippinensis** R. infra n. 18;
f. 1. **genuina** R. l. c.; Luzon;
* f. 2. **mindanaensis** R. l. c. Mindanao.

POMETIA

pinnata Forst. Babuyanes, Mindoro, Ticao, Mindanao.—Distr.: Peninsula et ins. malaicae, Moluccae, Papuasia, Micronesia.

NEPHELIUM

lappaceum L., R. in Elm. V p. 1616. Palawan.—Distr.: India orientalis, archipelagus indicum, Indo-China (et China ?).
chryseum Bl., R. in Elm. V p. 1616. Palawan.—Distr.: Burma, Malacca, Sumatra, Borneo, Tonkin.
intermedium R. in Perk. p. 61. Luzon, Mindanao, Jolo.

robustum R. in Elm. V p. 1607. Palawan.
(*) **mutabile** Bl. Luzon, Leyte (*Cubilia Blancoi*, non Bl., Vidal Revis., 1886, p. 96, coll. *n. 1048*, Luzon; *Nephelium* sp. id. ibid. p. 98, coll. *n. 215*, Luzon; accedunt collectiones: *Ahern's collector n. 1119, 2904, 3085*, Luzon; *Ramos n. 2126*, Luzon; *Elmer n. 9322*, Luzon; *Rosenbluth n. 12887*, Leyte).—Distr.: Peninsula malaica, Sumatra, Java, Borneo.
xerospermoides R. in Elm. V p. 1608. Mindanao.

ALECTRYON

* **inaequilaterus** R. infra n. 19. Ubian.
* **excisus** R. infra n. 20. Tinago.
* **ochraceus** R. infra n. 21. Negros.
* **fuscus** R. infra n. 22. Luzon.

CUBILIA

Blancoi (Blo.) Bl. Luzon, Mindanao.

GUIOA

diplopetala (Hassk.) R. in S. Holl.-I. p. 88, in Perk. p. 63. Mindanao.—Distr.: Insulae sundaicae, Moluccae, Indo-China.
pleuropteris (Bl.) R. in S. Holl.-I. p. 39, in Perk. p. 63. Mindanao, Palawan.—Distr.: Peninsula malaica, Indo-China, Sumatra, Borneo.
salicifolia R. in Elm. V p. 1608. Sibuyan.
aptera R. in Perk. p. 62. Luzon.
lasiothyrsa R. in Perk. p. 63. Luzon, Palawan; f. *Elmeri* R. in Elm. V p. 1609. Luzon.
subapiculata R. in Perk. p. 64. Culion, Palawan.
* **falcata** R. infra n. 23. Luzon.
* **reticulata** R. infra n. 24. Luzon.
* **sulphurea** R. infra n. 25. Luzon.
discolor R. in Elm. V p. 1609. Luzon.
myriadenia R. in Elm. V p. 1610. Luzon.
pubescens (Zoll. & Mor.) R. in S. Holl.-I. p. 10, 41, in Elm. V p. 1616. Palawan.—Distr.: Peninsula malaica, Sumatra, Bangka, Java.
glauca (Labill.) R. in S. Holl.-I. p. 38. Palawan.—Distr.: N.-Caledonia.
truncata R. in Elm. V p. 1611. Mindanao.
Perrottetii (Bl.) R. in S. Holl.-I. p. 38. Luzon, Mindoro, Sibuyan, Panay, Guimaras, Cebu, Mindanao, Balabac.
* **acuminata** R. infra n. 26. Luzon.

CUPANIOPSIS

patentivalvis R. in Elm. V p. 1612. Luzon.

GLOEOCARPUS

* **crenatus** R. infra n. 27. Luzon.

RHYSOTOECHIA

* **acuminata** R. infra n. 28. Luzon.
* **striata** R. infra n. 29. Mindanao.

DICTYONEURA

philippinensis R. in Elm. V p. 1613. Mindanao.
rhomboidea R. in Ph. J. p. 182. Polillo.
sphaerocarpa R. in Elm. I, p. 209. Leyte.

TRIGONACHRAS

*** obliqua** R. infra n. 30. Luzon.
cultrata (Turcz.) R. in S. Holl.-I. p. 46. Luzon.
cuspidata R. in Ph. J. p. 182. Polillo.
*** rigida** R. infra n. 31. Luzon.
*** membranacea** R. infra n. 32. Ticao, Panay.
brachycarpa R. in Elm. V p. 1614. Mindanao.
*** spectabilis** R. infra n. 33. Mindanao.

ELATTOSTACHYS

verrucosa (Bl.) R. in S. Holl.-I. pp. 12, 43. Babuyanes, Luzon, Ticao, Palawan.—Distr.: Java, Celebes, Timor.

ARYTERA

litoralis Bl.; R. in Perk. p. 64. Luzon, Guimaras, Leyte, Mindanao.—Distr.: Burma, peninsula malaica, Indo-China, insulae sundaicae, Moluccae, N.-Guinea.
rufescens (Turcz.) R. in S. Holl.-I. p. 44. Luzon, Marinduque, Panay.—Distr.: Borneo, Celebes.

GONGROSPERMUM

*** philippinense** R. infra n. 34. Luzon.

MISCHOCARPUS

ellipticus R. in Elm. I, p. 210. Leyte.
fuscescens Bl.; R. in S. Holl.-I. pp. 12, 43. Luzon, Leyte, Mindanao.—Distr.: Assam, Burma, Indo-China, Java, Borneo.
salicifolius R. in Perk. p. 64. Luzon.
triqueter R. in Perk. p. 65. Luzon, Guimaras.
*** cauliflorus** R. infra n. 35. Mindoro.
sundaicus Bl; R. in Perk. p. 65. Luzon, Polillo, Mindanao, Jolo.—Distr.: Peninsula malaica, Indo-China, China, ins. sundaicae, Moluccae, Papuasia, Australia.
endotrichus R. in Elm. V p. 1615. Palawan.
*** brachyphyllus** R. infra n. 36. Luzon.

LEPIDOPETALUM

Perrottetii Bl.; R. in Perk. p. 66. Luzon, Panay, Mindanao.—Distr.: Insulae Key, Timorlaut.

PARANEPHELIUM

(*) **xestophyllum** Miq. Mindanao (Coll. *Williams n. 2361*).—Distr.: Burma, Sumatra.

DODONAEA

viscosa Jacq.,
var. α. **vulgaris** Benth.,
f. 1. **repanda** R. in Fl. bras. p. 646. Luzon, Cebu, Palawan.—Distr.: Regiones tropicae et subtropicae totius orbis;
f. 3. **Burmanniana** R. l. c. Luzon, Mindoro, Mindanao.—Distr.: Ut f. 1;
var. β. **angustifolia** Benth. Luzon.—Distr.: Ut var. α.

GANOPHYLLUM

falcatum Bl. Luzon, Guimaras, Negros, Mindanao.—Distr.: Insulae Andamanicae, Java, N.-Guinea, Australia orientalis. (*G. obliquum* Merrill. c. syn. "*Boswellia? obliqua* Blo.," vix recte huc recensita).

HARPULLIA

* **macrocalyx** R. infra n. 37. Luzon.

(*) **cupanioides** Roxb. Panay, Jolo (H. sp. Vidal in Catal. Herb., 1892, p. 55 coll. n. 2527, Jolo, et. *H. confusa* Bl. ibid., coll. n. 2529, Panay).—Distr.: India orientalis, Indo-China, China, insulae sundaicae, N.-Guinea.

arborea (Blo.) R. in Sitz. XVI p. 404, in Perk. p. 66. Luzon, Mindoro, Marinduque, Guimaras, Mindanao, Jolo, Palawan.—Distr.: India orientalis, Indo-China, Sumatra, Java, Celebes, insulae Salomonis et Samoanae.

SPECIES NOVAE

1. **ALLOPHYLUS LARGIFOLIUS** Radlk. in Sitz. K. B. Ac. XXXVIII (1908) p. 226.

Frutex; rami teretes, glabri, lenticellis albidis lineoliformibus notati, cortice e viridi cinerescente; folia 1-foliolata, petiolo mediocri supra canaliculato subtus convexo striato minutim puberulo; foliolum largissimum, obovato-ellipticum, apice breviter obtuse vel acutiuscule acuminatum, basi obtusa petiolulo brevi cum petiolo articulato insidens, integerrimum, membranaceum, nervis lateralibus patentibus parum curvatis immo substrictis ante marginem arcuato-anastomosantibus utrinque prominulis, pilis minutissimis tactu puberulum, margine sat dense breviter ciliatum, viride, subtus pallidius, utrinque subopacum, cellulis secretoriis crebris minutim pellucide punctatum, epidermide non mucigera; thyrsi simplices, axillares, petiolos subduplo superantes, pedunculo perbrevi, dense cincinnigeri, glabriusculi; cincinni stipitati, pauciflori; flores magni, conspicue pedicellati; fructus cocci mediocres, subglobosi, pulverulento-puberuli, basi pilosculi, virides (Merrill), sicci aurantiaci.

Frutex ad 1 m altus (Merrill). Rami 5 mm crassi. Folia petiolo 2.5–4 cm longo adjecto 25–35 cm longa, 10–22 cm lata. Thyrsi 7 cm longi, pedicelli 3–4 mm longi. Alabastra diametro 2.5 mm. Sepala minutim puberula; petala cochleariformia, ungue longo villoso, squama barbata; discus circa petalorum insertiones subciliatus; stamina villosa; germen sub lente puberulum. Fructus plerumque 2-cocci, coccis 8 mm longis, 6 mm crassis.

In Philippinarum insula Mindanao: Merrill n. 5475 (Zamboanga, prov. Zamboanga, in declivibus silvosis alt. ±75 m, m. Oct. 1906, flor. et fruct.; comm. ex Hb. Manil.).

2. **ALLOPHYLUS APIOCARPUS** Radlk. in Sitz. K. B. Ac. XXXVIII (1908) p. 227.

Frutex; rami teretes, internodiis superioribus abbreviatis, glabri, usque ad folia summa subere albo obtecti; folia 1-foliolata, petiolo brevi supra sulcato pilis brevibus laxe adsperso; foliolum

mediocre, oblique rhombeo-ellipticum, breviter obtusiuscule acuminatum, basi in petiolulum brevissimum cum petiolo articulatum oblique attenuatum, a medio remote dentatum, membranaceum, nervis lateralibus obliquis substrictis utrinque prominulis superioribus in dentes excurrentibus, laxe reticulato-venosum, glabrum nec nisi subtus in axillis nervorum pilosulum, saturate et subaeruginose viride, subtus pallidius, utrinque nitidulum, epidermide inferiore quoque sat mucigera; thyrsi simplices, graciles, folia aequantes, curvati, pedunculo sat longo, laxe cincinnigeri, cincinnis sessilibus, glabri; flores mediocres, glabri; fructus monococcus mediocris, piriformis, basi pluricostatus, glaber (siccus), aurantiacus.

Rami 2–3 mm crassi. Folia petiolo ad 1.5 cm longo adjecto 15–18 cm longa, 6.5–8.5 lata. Thyrsi 12–18 cm longi, pedunculo 4–6 cm longo. Fructus cocci 9 mm longi, 6 mm crassi, pedicellis 3–4 mm longis.

In Philippinarum insula Cebu: *B. Espinosa n. 6120* (m. Sept. 1906, fruct.; comm. ex Hb. Manil.).

3. ALLOPHYLUS BREVIPETIOLATUS Radlk.

Schmidelia sp. Vidal Cat. Herb. (1892) p. 52, n. 3693.

Rami teretes subflexuosi, internodiis brevibus, glabri, cortice albido lenticelloso-punctato; folio 1-foliolata, interdum rudimentis foliolorum lateralium minutis subulatis instructa, petiolo perbrevi supra sulcato laxe pilosiusculo; foliolum mediocre, obovato-ellipticum, apice obtusiusculum vel subemarginatum, basi obtusum, integerrimum vel supra medium dente uno alterove obsoleto instructum, chartaceum, nervis lateralibus patulis prope marginem procurvis nervoque mediano valido subtus prominentibus, praeter axillas nervorum subtus barbatas glabrum, nitidum, subfuscum, utriculis laticiferis ad paginam inferiorem instructum, epidermide inferiore e cellulis majusculis valde mucigeris illas epidermidis superioris aequantibus alliisque minoribus stomatibus vicinis conflata; thyrsi simplices, tertiam foliorum partem vix aequantes, pedunculo subnullo, rhachi dense cincinnigera hispidula; flores parvi, glabri; fructus—(non suppetebant).

Rami 3–4 mm crassi, internodiis superioribus 0.5–1 cm, inferioribus 2–3 cm longis. Folia petiolo 5–8 mm longo adjecto 12–18 cm longa, 4–7 cm lata. Thyrsi ad 5 cm longi, pedunculo vix 0.5 cm longo. Alabastra diametro 1 mm.

In Philippinarum insula Panay: *Vidal n. 3693* (Miagao, prov. Ilo-ilo, flor.; Hb. Kew.-In Cat. Herb. l. c. ins. Balabac indicata est).

4. ALLOPHYLUS PEDUNCULARIS Radlk.

Schmidelia sp. Vidal Cat. Herb. (1892) p. 52, n. 3716! 3740!

Frutex sat altus; rami teretes, stricti, glabri, cortice mox albescente lenticelloso; folia 1-foliolata, interdum rudimentis foliolorum lateralium minutissimis subulatis instructa, petiolo brevi supra complanato et parce puberulo; foliolum mediocre, ovali- vel oblongo-lanceolatum, breviter obtuse acuminatum, remotiuscule obtuse dentatum, basi subacutum, submembranaceum, nervis lateralibus obliquis in dentes excurrentibus, glabrum, laeve, nitidulum, supra lividum, subtus primum viride nervis albidis, dein rubro-fuscum, cellulis secretoriis crebris, sed parvis (vix puncta pellucida efficientibus) instructum, epidermide inferiore quoque mucigera; thyrsi simplices, foliola nunc dimidia, nunc tota aequantes, pedunculo rhachin aequante vel paullo superante, rhachi dense cincinnigera striata laxe puberula; flores parvuli, glabri, fructus—(non suppetebant).

Frutex 2–metralis; rami 2–3 mm crassi. Folia petiolo 1–2 cm longo adjecto 12–18 cm longa, 5–7 cm lata. Thyrsi 6–18 cm longi, pedunculo 3–10 cm longo.

In Philippinarum insulis Ticao et Masbate: *Vidal n. 3716, 3740* (Ticao, fl.; Hb. Kew.-In Cat. Herb. l. c. ins. Paragua indicata est); *R. Rosenbluth n. 1266* (Masbate, m. Apr. 1909, fl.; comm. ex Hb. Manil.).

5. ALLOPHYLUS HYMENOCALYX Radlk. in Sitz. K. B. Ac. XXXVIII (1908) p. 229.

Arbor parva vel frutex; rami teretes, extimo apice thyrsique minutim sordide puberuli, mox glabrati, cortice albicante; folia 3-foliolata, mediocria, sat petiolata, petiolo supra leviter sulcato glabro; foliola nunc obovata vel lateralia ovalia, nunc lanceolata, apice brevius longiusve acuminata, basi cuneata vel obtusiuscula, longiuscule petiolulata, remote dentata, rigidiuscule coriacea, nervis lateralibus sat approximatis obliquis vel procurvis subtus magis quam supra prominentibus, supra e viridi fuscescentia, subtus pallida, utrinque nitidula, glabra, epidermide inferiore sparsim crystalla singula vel crystallorum concretiones fovente; thyrsi simplices, sat robusti, petiolos superantes, interdum geminati vel ad rhacheos basin ramulo aucti, minutim sordide puberuli, densiflori; flores magni, puberuli, breviter pedicellati; fructus—(non suppetebant).

Arbor expansa, 4 m alta vel frutex 3-metralis. Rami 4 mm crassi. Folia petiolo 3–4 cm longo adjecto 12–15 cm longa; foliola intermedia cum petiolulo 6–10 mm longo 9–12 cm longa, 4–6.5 cm lata, lateralia minora. Thyrsi 4–12 cm longi. Alabastra diametro 2 mm. Sepala petaloidea, albicantia, puberula;

petala cochleariformia, ungue lato piloso, squama bifida albide villoso-barbata; discus glaber; stamina et germen pilosa.

In Philippinarum insula Mindanao: *Copeland n. 1635* ("District of Zamboanga," alt 700 ped., m. Febr. 1905; fl.); *Merrill n. 8195* (in eod. distr., "Sax River Mountains" alt. ca. 1,000 m, in silvis, m. Nov.-Dec. 1911, fl.; comm. ex Hb. Manil.); *Elmer n. 13499* ("prov. of Agusan, Cabadbaran, Mount Urdaneta," m. Aug. 1912, fl.; comm. Elmer).

6. **ALLOPHYLUS GRANULATUS** Radlk.

Frutex vel arbor parva; rami teretes, glabriusculi, cortice pallescente laxe lenticelloso-punctato, innovationes puberuli; folia 3-foliolata mediocria, longiuscule petiolata, petiolis supra sulcatis glabriusculis; foliola elliptico-lanceolata, subacuminata, obsolete dentata, basi subacuta, intermedia longius, lateralia breviter petiolulata, chartacea, nervis lateralibus sat approximatis procurvis, glabriuscula, subtus in nervorum axillis barbata, utrinque nitidula, supra inaequaliter livescentia, subtus viridia; thyrsi axillares solitarii, folia subaequantes, pedunculo brevi, rhachi laxe puberula; flores non visi; fructus in thyrsi parte superiore sat crebri, breviter pedicellati, abortu monococci, coccis mediocribus subclavato-obovoideis, cellulis magnis resinigeris prominulis granulatis, basi vix costatis, glabris, flavis (t. Fenix), siccis aurantiacis.

Rami 3 mm crassi. Folia petiolo 4–5 cm longo adjecto 15–20 cm longa; folia cum petiolulis 3–8 mm longis 12–16 cm longa, 4.5–6 cm lata. Thyrsi cum pedunculo 2.5 cm longo 14 cm longi. Fructus cocci 8–9 mm longi, 6 mm crassi.

Affinis All. javensi Bl., a quo differt fructu granulato aurantiaco (nec laevi atropurpureo) et foliolorum epidermide inferiore non crystallophora.

In Philippinarum insula Luzon: *E. Fénix n. 12560* (subprov. Benguet, Sablang, m. Nov.-Dec. 1910, fr.; comm. ex Hb. Manil.).

7. **ALLOPHYLUS CHLOROCARPUS** Radlk. in Sitz. K. B. Ac. XXXVIII (1908) p. 232.

Arbor mediocris; rami teretiusculi, subflexuosi, juveniles ut et thyrsi petiolique sordide hirtelli, cortice cinnamomeo dense lenticelloso; folia 3-foliolata, mediocria, petiolata; foliola intermedia obovato-lanceolata, basi subcuneata, longiuscule petiolulata, lateralia elliptica, inaequilatera, basi obtusa petiolulis brevibus insidentia, omnia apice obtuse acuminata, remote obtuse dentata, subcoriacea, nervis lateralibus sat remotis oblique procurvis, supra laevigata saturate viridia, subtus reticulato-venosa pallidiora, utrinque nitidula, praeter nervos supra sordide puberulos glabra nec nisi pilis microscopicis subulatis subtus ad-

spersa, epidermidis inferioris cellulis sparsis (et quidem saepius geminatis vel compluribus vicinis) crystallorum concretiones majores vel rarius crystalla singula foventibus; thyrsi ad rhacheos basin ramo uno alterove instructi, foliis nunc longiores nunc breviores, crassiusculi, dense cincinnigeri, sordide hirtelli; flores majores, glabriusculi; fructus cocci (submaturi) obovoidei, majusculi, glabri nec nisi glandulis microscopicis adspersi, obscure virides.

Arbor 5 m alta. Rami 3–4 mm crassi. Folia petiolo 2–3.5 cm longo adjecto 12–20 cm longa; foliola intermedia cum petiolulis 6–12 mm longis 10–16 cm longa, 3.5–6 cm lata, lateralia paullo minora, petiolulis 3–5 mm longis. Thyrsi 7–12 cm longi, pedunculo 1.5–3 cm longo. Sepala glabra; petala anguste cuneata, sublinearia, ungue margine villoso, squama bifida densissime albide villoso-barbata; discus glaber; stamina subglabra; germen pilis subnullis, glandulis vero microscopicis crebris obsitum. Fructus cocci 8 mm longi, 6 mm crassi.

In Philippinarum insula Palawan: *H. M. Curran 3473* (in silvis caesis, alt. 10 m, m. Jan. 1906, fr.; comm. ex Hb. Manil., ut seqq.). Huc quoque recensenda videtur etsi germine minutissime puberulo quodammodo recedens: *Mary Strong Clemens n. 769* (Camp. Keithley, Lake Lanao, Mindanao m. Sept.–Oct. 1906, flor.) et *n. 1170*, a (ex eod. loco, m. Sept. 1907, flor.; specim. mancum thyrso depauperato simplici).

8. **APHANIA LOHERI** Radlk.

Arbor mediocris; rami teretes, e subfusco cinerascentes, lenticelloso-punctati, glabri; folia plerumque 2-juga, raro 3-juga, petiolo basi tumido lenticellis asperiusculo; foliola subopposita, anguste lanceolata, elongata, apice sensim acutata, basi acuta petiolulis brevibus incrassatis insidentia, subcoriacea, nervis lateralibus numerosis oblique adscendendibus ante marginem anastomosantibus subtus prominentibus, reticulato-venosa, glabra, supra pallide viridia nitidula, subtus canescentia opaca, cellulis secretoriis raris instructa, crystallorum concretionibus prope paginam superiorem creberrimis, glandulis microscopicis vix immersis raris ornata; thyrsi singuli vel bini axillares, simplices vel rarius ramo prope basin aucti, sat dense cymulas (inferiores stipitatas, superiores subsessiles) gerentes, subglabri; alabastra globosa, pedicellata; sepala 5, parce glanduloso-ciliolata; petala 5, ovata, ciliolata, intus basi squamulis 2 pilosulis aucta; discus patellaris glaber; stamina 7, filamentis basi pilosis quam antherae glabrae acutae paullulo brevioribus; germinis rudimentum (fl. ♂) dimerum, parce pilosulum; fructus-(non suppetebat).

Rami 3–5 mm crassi. Folia petiolo 2–4.5 cm longo adjecto 15–30 cm longa; foliola 10–20 cm longa, 2–5.5 cm lata, petiolulis 3–5 mm longis. Thyrsi 3–15 cm longi, stipite cymularum inferiorum ad 4 mm longo. Alabastra diametro 2.5 mm. Pedicelli 1.5–2 mm longi, basi articulati.

In Philippinarum insula Luzon: *A. Loher n. 5874* (Montalban, prov. Rizal, m. Jul. 1905, fl.).

9. **HEBECOCCUS INAEQUALIS** Radlk. Vulgo "Jaguliao" in lingua Viscaya, t. Everett in sched.

Arbor mediocris; rami compressiusculi (subfasciati), sulcati, alutaceo-tomentelli, denique glabrati, cortice pallide griseo-subfusco; folia ca. 6-juga, petiolo tereti striato glabro, rhachi supra 2-sulcata; foliola subopposita vel superiora alterna, oblongo-lanceolata, ± inaequilatera (latere interiore latiore), apice sensim acutata, basi inaequaliter acuta petiolulis crassiusculis insidentia, chartacea, nervis lateralibus sat approximatis obliquis subtus prominulis, reti venarum vix perspiciendo, glaberrima, supra laevia splendentia, subtus subopaca, aeruginoso-viridia, impunctata, epidermide mucigera, glandulis microscopicis immersis clavatis aliisque verruciformibus (generis more) ornata; paniculae sat amplae, rhachi 3-angulari ramisque sulcatis alutaceo-puberulis; flores generis; fructus juveniles anguloso-corrugati, pallide ochracei, stylo conico inter rugas immerso, insignes pericarpii parte exteriore aeruginoso-viridi interiore pallido, maturi—(non suppetebant).

Arbor 12 m alta, trunco cm crasso. Rami ad 1.5 cm crassi. Folia petiolo ad 15 cm longo adjecto ad 40 cm longa; foliola cum petiolulis 5 mm vix excedentibus ca. 14 cm longa, 4 cm lata. Paniculae ca. 30 cm longae, rhachi 5 mm crassa, ramis 7–13 cm longis procurvis; dichasiorum stipites 5 mm longi.

In Phil[illegible]ppinarum insula Cebu: *H. D. Everett n. 6459* (in declivibus silvaticis, alt. 320 m, m. Febr. 1907, fl. et fr. juv.; common. ex Hb. Manil.).

10. **HEBECOCCUS FALCATUS** Radlk.

Arbor mediocris; rami teretiusculi, sulcati, sordide alutaceo-tomentelli, basi glabrati, cortice griseo-subfusco albide maculato; folia 8–19-juga, jugis sursum decrescentibus, petiolo supra planiusculo, subtus convexo, striato, glabro, rhachi supra bisulcata et inter sulcos costa elevata notata, subtus sulcato-striata, striis puberulis; foliola subopposita, elongate ovato-lanceolata, inaequilatera (latere interiore latiore), saepius conduplicata et falcatim recurvata, apice acutata, basi oblique ovata in petiolulos longiusculos supra sulco exaratos contracta, subcoriaceo-char-

tacea, nervis lateralibus sat approximatis procurvis longius ante marginem anastomosantibus subtus prominentibus, reti venarum supra vix, subtus sat conspicuo, glaberrima, supra laevia splendentia, subtus subopaca, olivaceo-viridia, impunctata, epidermide valde mucigera (muco aqua expanso particulas tarde deliquescentes includente), glandulis microscopicis immersis clavatis aliisque verruciformibus (generis more) ornata; paniculae terminales amplissimae, iterum et iterum ramosae, rhachi ramisque 3-angularibus sulcatis cymulas (dichasia vel cincinnos) stipitatas gerentibus sordide alutaceo-tomentellis; flores generis; fructus abortu 1-locularis, 1-coccus, oblique globosus, styli reliquiis ad medium latus apiculatus, loculis abortivis infra stylum vix prominulis, reticulato-rugosus, tomento brevi setaceo ochraceo-sufferrugineo indutus, intus spadiceus glabriusculus pilis brevibus pachydermicis vix nisi ad seminis insertionem adspersus; loculorum abortivorum gemmula paullulum aucta funiculi margine superiore in membranulam extenuato (quasi arilli vestigio sub semine ipso evanido) cincta; semen obovoideum, testa tenuiter coriacea badia; embryo ovoideus vel subglobosus, cotyledonibus plano-convexis lateraliter oblique juxtapositis stomatophoris amyligeris crystallorum concretionibus persitis, radicula infra medium dorsum papilliformi, testae foveola excepta.

Arbor 12–13 m alta, trunco 40 cm crasso. Rami 1 cm crassi. Folia petiolo ad 12 cm longo adjecto ad 50 cm longa; foliola cum petiolulis 8–15 mm longis 12–16 cm longa, 4.5–5 cm lata. Paniculae 30–50 cm longae, ramis erectis. Alabastra diametro ca. 3 mm. Fructus (siccus) diametro 1.8 cm.

In Philippinarum insulis Leyte et Luzon: *R. Rosenbluth n. 12631* (Leyte, in valleculis silvaticis, alt. 60 m, m. Mart. 1909, fr.; comm. ex Hb. Manil., ut et seq.); *F. W. Darling n. 18689* (Luzon, prov. Tayabas, Guinayangan, alt. 30 m, m. Nov. 1909, fl.).

11. LEPISANTHES VIRIDIS Radlk.

Arbor parva; folia 4-juga, petiolo elongato striato subhirsuto; foliola opposita, oblonga, breviter acuminata, basi obtusa petiolulis supra sulcatis insidentia, chartacea, nervis lateralibus procurvis, utrinque viridia, praeter nervum medianum subtus laxe pilosum subglabra, glandulis (supra profundius subtus parum) immersis ornata, epidermide paginae inferioris sparsim (hic illic in cellulis geminatis) crystallorum concretiones parvas gerente; thyrsi ad foliorum cicatrices fasciculati, sat dense cincinnos stipitatos gerentes, alabastraque cano-tomentella; flores mediocres, breviter pedicellati; sepala exteriora tomentella, interiora seri-

cea; petala 5, lineari-oblonga, dorso sericea, intus glabra, squama biloba ecristata subtus parce puberula aucta; discus regularis, glaber; stamina 8, superne hirsuta, antherae dorso parce pilosae; germinis rudimentum 3-loculare, dense pilosum.

Rami defoliati thyrsigeri 1 cm crassi, cinerascentes, juniores pallide subfusci, lenticellis sufferugineis rimoso-striati. Folia petiolo ad 12 cm longo adjecto 40–50 cm longa; foliola superiora (majora) cum petiolulis 5 mm longis 28 cm longa, 6.5 cm lata, infima plus dimidio minora. Thyrsi 8–14 cm longi. Alabastra diametro 3 mm. Pedicelli 2.5 mm longi.

In Philippinarum insula Mindanao: *H. N. Whitford & W. I. Hutchinson n. 9266* (Zamboanga, Banga, alt. 70 m, m. Jan. 1908; Hb. Manil.).

12. OTOPHORA SETIGERA Radlk.

Arbor parva; folia (unum basi mutilatum tantum visum) 8-juga, rhachi striata minutim puberula; foliola alternantia, lanceolata, apice acuminata, basi cuneata, subsessilia, chartacea, nervis lateralibus approximatis obliquis procurvis, in nervo mediano subtus infra medium setis validis obsita, ceterum glabra, opaca, livida, epidermidis paginae inferioris cellulis pachydermicis subreticulato-punctatis, utrinque glandulis cylindricis e cellulis ca. 12 uniseriatis exstructis basi immersis ornata (foliola infima non visa); fructus (fide schedae) "paniculati" (panicula "decerpta" verisimiliter a trunco enata), ellipsoidei, (sicci) tenuiter crustacei, coccinei, utrinque leviter sulcati, septo evanido 1-loculares, dispermi; semina semiellipsoidea, contigua, basi affixa, testa fusco-spadicea subcoriacea.

Arbor 8 ped. alta. Folium (mutilatum) 50 cm longum; foliola intermedia ad 20 cm longa, ad 4 cm lata, superiora et inferiora paullo minora. Fructus ad 2 cm longus, fere totidem latus.

In Philippinarum insula Mindanao: *Maj. E. A. Mearns et W. I. Hutchinson n. 4569* (Mount Malindang, prov. Misamis, in silvis, altit. 3000 ped., m. Majo 1906, fruct.; comm ex Hb. Manil.).

13. TRISTIROPSIS SUBFALCATA Radlk.

Foliorum bipinnatorum pinnarumque rhachis teretiuscula, glabrata; foliola (singularum pinnarum) ca. 11, alterna, elongate ovato-lanceolata (quadruplo longiora quam lata), quodammodo conduplicata et falcatim recurvata, apice obtusiuscula, basi inaequaliter in petiolulos attenuata, e chartaceo subcoriacea, margine subundulata, subfusca, supra nitida, subtus opaca; panicula (fructifera tantum visa) sat ampla, ramis divaricatis; fructus breviter ellipsoideus, leviter 3-angulatus, juxta angulos sulco levi notatus, in stipitem perbrevem contractus, apice breviter apiculatus, pube perbrevi e flavido canescenti indutus.

Foliorum pinnae ca 22 cm longae; foliola cum petiolulis 3 mm longis ca. 12 cm longa, 3 cm lata. Panicula 20 cm longa, 9 cm lata, rhachi 3 mm crassa, ramis 7–12 cm longis, pedicellis (fructigeris) 6–7 mm longis. Fructus 2.2 cm longus, 1.4 cm crassus.—Valde affinis T. subangulae, a qua differt foliis robustioribus et fructibus minoribus.

In Philippinarum insula Basilan: *H. Hallier* (m. Jan. 1904; Hb. Manil.).

14. **TRISTIROPSIS OBLONGA** Radlk. Vulgo, "Tagom-tagom" in lingua Tagalog t. Merritt in sched.

Arbor magna; foliorum bipinnatorum pinnarumque rhachis striolata, laxe minutim puberula; foliola (singularum pinnarum) 9–10, alterna, breviter oblonga (triplo longiora quam lata, infima tantum breviora), apice rotundato-obtusata, interdum emarginata, basi inaequaliter in petiolulos perbreves attenuata, membranacea, subfusca, supra nitidula, subtus opaca; panicula (fructifera tantum visa) mediocris, ramis oblique erectis rhachique dense lenticelloso-punctatis; fructus breviter ellipsoideus, obsolete 3-angulatus, apiculatus, estipitatus, pube brevissima cana indutus.

Arbor 22 m alta, diametro (1.3 m supra solum) 20 cm. Folia petiolo 3 cm longo adjecto 32 cm longa, pinnae ca. 20 cm longae; foliola cum petiolulis vix 2 mm longis ca. 9 cm longa, 3 cm lata. Panicula 14 cm longa, 7 cm lata, rhachi 2.5 cm crassa, ramis ad 5 cm longis, pedicellis (fructigeris) 8–10 mm longis. Fructus 2.2 cm longus, 1.8 cm crassus.—A reliquis speciebus differt foliolis oblongis obtusatis basi et apice aeque latis.

In Philippinarum insula Mindoro: *M. L. Merritt n. 4063* (Bongabong River, m. Apr. 1906; Hb. Manil.).

15. **TRISTIRA PUBESCENS** Merrill in Bull. Govt. Lab. (Philip.) 6 (1904) p. 12.

Formas 2 distinguere licet:

Forma 1. **Genuina** Radlk.: Rami, petioli subtusque folia ± dense pubescentia.

Forma 2. **Hemidasya** Radlk.: Rami, petioli rachisque foliorum pube densa molli induta, foliola subglabra nec nisi pilis raris subtus adspersa.

In Philippinarum insula Luzon: Forma 1: *Vidal n. 220* (San Miguel de Mayumo, prov. Bulacan, ca. 1883, fl.; Herb Kew.); *Merrill n. 2842* (prov. Rizal, Bosoboso, m. Juli 1903, fr. semimat.; comm. ex Hb. Manil., ut et seqq.); *Elmer n. 5639* (prov. La Union, Bauang, m. Febr. 1904, fr.); *Ahern's collector n. 3156* (prov. Rizal, m. Maj.-Jun. 1905, fr.). Forma 2: Ahern's collector *n. 421* (prov. Rizal, Antipolo, m. Febr. 1904, fl.).

16. **EUPHORIA NEPHELIOIDES** Radlk. Vulgo "Supac" in indigenarum dialecto (t. Klemme in sched.)

Arbor mediocris, rami teretes, striati, apice ut et petioli inflorescentiaeque pilis minutis fasciculato-stellatis sufferrugineis adspersi, mox glabrati, cortice cinerascente; folia bijuga; foliola subopposita, superiora majora elliptica obtusiuscula vel subacuta in petiolulos attenuata, inferiora minora subovata, omnia integerrima, membranaceo-chartacea, nervo mediano supra impresso, nervis lateralibus utrinque 12–14 sat approximatis oblique patulis subtus prominentibus, supra glabra nitidula, subtus ad nervos pilis fasciculato-stellatis raris adspersa papillosa pallescenti-opaca; paniculae terminales, folia subaequantes, laxe ramosae (fructigerae tantum visae) ; fructus breviter pedicellati, calyce persistente tomentello suffulti, intra discum hirsutum inserti, abortu monococci: cocci globosi, processibus subuliformibus sulcatis obtusiusculis vel truncatis (siccis) rigidis undique patentibus insigniter echinati, glabrati.

Arbor 10-metralis (Klemme in sched.) Rami 3 mm crassi. Folia petiolo 4–5 cm longo adjecto ad 28 cm longa; foliola superiora cum petiolulis 8 mm longis ad 16 cm longa, 8.5 cm lata, inferiora dimidio minora. Paniculae 18 cm longae. Fructus cocci processibus 4 mm longis inclusis diametro 2 cm.

In Philippinarum insula Basilan: *W. Klemme n. 15218* (m. Aug. 1910, fr.; comm. ex Hb. Manil.).

Species foliolorum forma fructuque insigniter echinato *Nephelium mutabile* Bl. quodammodo aemulans.

17. **EUPHORIA FOVEOLATA** Radlk.

Arbor parva; rami teretes, striati, apice ut et petioli inflorescentiaeque pilis brevibus fasciculato-stellatis adspersi, cortice cinereo lenticelloso; folia bijuga; foliola subopposita, latiuscule ovata vel superiora elliptica, obtusiuscula, petiolulis supra planiusculis insidentia, integerrima, chartacea, nervo mediano supra impresso nervisque lateralibus utrinque 10–11 obliquis subtus prominentibus, utrinque prominente reticulato-nervosa, supra glabra, nitidula, subtus pilis fasciculato-stellatis perraris adspersa, dense breviter papillosa, flavescenti-opaca, in nervorum axillis foveolata; paniculae terminales, folia superantes, ramis thyrsoideis erectis dense cymulas subsessiles (dichasia in cincinnos abeuntia) gerentibus; flores breviter pedicellati; calycis segmenta latiuscule ovata, extus pilis fasciculato-stellatis brevibus tomentella, intus pilis simplicibus vel binis ternis in

fasciculum congestis pubescentia; petala spathulato-oblonga, calyce sesquilongiora, extus praeter apicem intus tota sordide villosa; discus hirsutus; stamina superne pilosula; germen (fl. ♂) redimentarium, 2-loculare, tomentosum; fructus-(non suppetebant).

Arbor 5-metralis. Rami 4 mm crassi. Folia petiolo 2–2.5 cm longo adjecto ca. 20 cm longa; foliola superiora cum petiolulis 5 mm longis 16 cm longa, 7 cm lata, inferiora 13 cm longa, 6.5 cm lata. Paniculae ad 22 cm longae.

In Philippinarum insula Luzon: *Maximo Ramos n. 7370* (prov. Cagayan, m. Mart. 1909, fl.; comm. ex Hb. Manil.).

18. **LITCHI PHILIPPINENSIS** Radlk. in litt. ad E. D. Merrill (28. XII. 1904); H. N. Whitford Veget. Lamao Forest, Philipp. Journ. Sc. I (1906) pp. 637, 639, 645, 647 (nomen); Radlk. in Engl. & Pr. Pfl.-Fam., Nachtr. III, Ergänz.-Heft II, Lief. 3 1907) p. 204.—*Nephelium Litchi*, non "Camb.," Vidal Revis. (1886) p. 97 et 344 *n. 722* et Catal. Hb. (1892) p. 54 *n. 722—Litchi* sp. nov. "teste Radlk. in litt." Merrill Fl. Lamao Forest, Philipp. Journ. Sc. I, Suppl. 1 (1906) p. 87.—Vulgo: "Halopag-amo" t. Vidal l. c.; "Alupag carabao" Tagalis t. Maule in sched.; "Alupag amo" in prov. Tayabas t. Merrill in litt.; Balañguas in lingua populi Manobo insulae Mindanao, t. Elmer in sched.

Arbor alta; ramuli teretes, pallide subfusci, lenticelloso-punctati, glabri; folia 1–2-juga; foliola lanceolata vel elliptica, subacuminata vel obtusata, basi subacuta, petiolulis sat longis supra sulcatis basi incrassatis suffulta, integerrima vel remote obscure crenata, a firmius pergameneo coriacea, nervis lateralibus subflexuosis procurvis subtus prominulis, glaberrima vel subtus perlaxe pilis medio affixis aegre perspiciendis adspersa, supra laevissima hypodermate fibroso continuo (nec ut in Euphoria Gardneri Thw. interrupto) instructa, subtus quoque sublaevia reti venarum vix prominulo epapilloso areolisque inter venas subquadratis non nisi in media parte papillosis, inde vix opaca, potius quodammodo nitidula, pallida, in alutaceum vergentia, cellulis secretoriis non nisi raris instructa; flores generis disco puberulo; fructus generis plerumque 1-coccus, ellipsoideus, processibus pyramidato-conicis 3–5-lateris altioribus quam latioribus acutis supra basin paullulum constrictam quodammodo bulbosis epidermide laevi hic illic crystallophora instructis cellulis secretoriis fere destitutis detergibilibus echinatus, viridis, glaber, exsiccando secus medianam ± fissus; semen basi arillo libero brevi acetabuliformi cinctum.

Arbor 35 m alta, trunco (1.5 m supra terram) 75 cm crasso, ligno duro (parum usitato). Ramuli ultimi 2.5 mm crassi.

Folia petiolo 3–5 cm longo adjecto 14–24 cm longa; foliola cum petiolulis 4–10 mm longis 8–14 cm longa, 2.5–8 cm lata. Fructus processibus inclusis 2.5–3 cm longus, 2–2.5 cm latus, non edulis (Maule in sched.).

Formas 2 distinguere licet:

Forma 1. **Genuina** Radlk.: Supra descripta.

Forma 2. **Mindanaensis** Radlk.: Foliola subtus undique (venae quoque et areolae inter venas totae) papillosa, inde opaca; fructus processus vix altiores quam latiores, non detergibiles.

In Philippinarum insulis Luzon et Mindanao. Forma 1: in Luzon: *W. M. Maule n. 846* (prov. Zambales, in collibus secus litora maris, altit. 30 m, m. Apr. 1904, fr. semimat.; comm. ex Hb. Manil.), *n. 2995* (eadem prov., Subic, m. Apr. 1905, fr. maturi; comm. ex Hb. Manil.); *R. Meyer n. 2812* (prov. Bataan, "Lamao River, Mount Mariveles", alt. 1700 ped., m. Mart., fl. "quodammodo fragrantes"; comm. ex Hb. Manil.); *Borden n. 2919* (Lamao Forest, m. Mart., t. Merrill l. c. 1906); *Whitford n. 1322* (ibid., t. eod.); *H. M. Curran n. 5959 6369* (prov. Bataan, m. Jan.-Mart. 1907, fl.; comm. ex Hb. Manil.); *Vidal n. 722* (prov. Tayabas, Unisan, fl.; Hb. Kew., ubi, ni fallor, numero *721* insignita est, ut et *Otophora fruticosa* Bl. [*Capura pinnata* Blo.], sub qua hic numerus *721* in Vidal Revis. p. 344 recte citatur, p. 97 vero sphalmate mutatus est in numerum *724* [ad *Aryteram rufescentem* Radlk. pertinentem et sub hac p. 96 et 344 recte indicatum]; hic error et in Vidal Catal. Herb. servatus est, ubi p. 54 sub *Capura pinnata* Blo. praeter *n. 721* etiam *n. 724* indicatus invenitur, ceterum recte *n. 724* sub *Arytera rufesc.* quoque p. 53, ut in Revis. p. 96 et 344).—Forma 2: in Mindanao: *Elmer n. 13270* ("prov. of Agusan, Cabadbaran, Mount Urdaneta", alt. 750 ped., m. Jul. 1912, fruct.; comm. Elmer).

19. **ALECTRYON INAEQULATERUS** Radlk.

Frutex; rami teretes, striati, petiolique glabrati, innovationibus flavide tomentellis; folia 2–3-juga; foliola opposita, ovato-oblonga, apice in acumen obtusiusculum sensim attenuata, basi inaequilatera, latere interiore breviore, breviuscule petiolulata, integerrima vel a medio remote paucidentata, chartacea, nervis lateralibus obliquis apice vel a basi curvatis, utrinque glabra, supra laevigata nitida, subtus subopaca, saturate viridia, epiderme mucigera; panicula (depauperata, ramum unum tantum thyrsoideum exhibens) in apice rami exillaris, folio + dimidio brevior, cymulas subsessiles gerens; flores non suppetebant; fructus obcordato-2-coccus, cocco altero saepius ± abortivo a lateribus compresso, coccis evolutis rhomboideo-ellipsoideis, margine superiore ± carinatis, tomento sordide flavo brevissimo indutis, subtransversim dehiscentibus, intus glabris; semina globosa.

Frutex 10 ped. altus (Merrill). Rami 2–3 mm crassi. Folia petiolo 4.5–5.5 cm longo adjecto ad 25 cm longa; foliola cum petiolulis 4 mm longis 12–15 cm longa, 5–6 cm lata. Panicula

ad 6 cm longa; pedicelli fructigeri 2.5 mm longi. Fructus cocci diametro 7 mm, in directione diagonali ca. 1 cm longi, pericarpio vix 1 mm crasso.

In Philippinis et quidem in archipelago Suluensi: *Merrill n. 5393* ("Ubian Island", ad littora maris, m. Oct. 1906, fruct.; comm. ex Hb. Manil.).

20. **ALECTRYON EXCISUS** Radlk.

Rami teretes, glabrati, cortice fusco; folia ca. 5-juga; foliola ovato-lanceolata, apice sensim acutata, basi rotundata petiolulis perbrevibus insidentia, a tertia inferiore parte remote leviter serrata, chartacea, utrinque glabra, laevia, subfusca, epidermide mucigera; thyrsi ad apices ramorum axillares, breves, pedicellique pilis brevibus adpressis laxe adspersi; calyx sub fructu relictus 5-dentatus, puberulus; petalorum vestigia nulla; discus glaber; fructus breviter et late obcordatus, apice late excisus, 2-coccus (raro cocco altero a lateribus compresso abortivo 1-coccus), axe inter loculos toto incrassato conico insignis, coccis compressiuscule ovoideis acutis, margine superiore prominulo costam obtusam exhibente, tomento brevissimo denso subochraceo indutis, intus glabris.

Arbor? Folia petiolo 4 cm longo adjecto ca. 20 cm longa; foliola cum petiolulis vix 2 mm longis 6.5–10 cm longa, 2.5–3 cm lata. Thyrsi ca. 7 cm longi. Fructus (submaturi) 7 mm alti, 12–14 mm lati, cocci diametro 5 mm, diagonaliter 6 mm longi, pericarpio 0.5–1 mm crasso.

In Philippinarum insula Tinago: *G. P. Ahern n. 470* (m. Febr.-Maj 1901, fr.; comm. ex Hb. Manil.).

21. **ALECTRYON OCHRACEUS** Radlk.

Rami superne sulcati, sat dense ochraceo-tomentelli; folia plerumque 5-juga; foliola opposita, lanceolata vel infima ovata, omnia subaequilatera, petiolulata, supra medium subserrato-dentata, subchartacea, supra glabra, laevia, nitidula, subtus ad nervos pilis crispatis puberula, e viridi in ochraceum vergentia, epidermide mucigera; thyrsi ad apices ramorum axillares, folia dimidia aequantes, pedicellique tomentelli; calyx sub fructu relictus 5-dentatus, puberulus; petalorum vestigia nulla; discus glaber; fructus latior quam altus, leviter obcordatus, 2-coccus (interdum cocco altero a lateribus compresso abortivo 1-coccus), coccis globosis contiguis (nec axe interjecto separatis) sulco mediano levi notatis dense ochraceo-tomentellis, intus glabris; semina subglobosa, parte dimidia inferiore (arillo rubro obtecta) exacte hemisphaerica, parte superiore (splendidissima nigra) conum humilem obtusum exhibente.

Arbor. Rami thyrsigeri 3 mm crassi. Folia petiolo 2 cm longo adjecto ca. 15 cm longa; foliola cum petiolulis 2 mm longis 7.5 cm longa, 2.5 cm lata, infimia paullo minora. Thyrsi ad 7 cm longi, pedunculo 2.5 cm longo incluso. Fructus 5–6 mm alti, 10–11 mm lati, cocci diametro 5–6 mm, pericarpio 0.5–0.8 mm crasso. Semina diametro 4 mm.

In Philippinarum insula Negros: *H. M. Curran n. 17455* (in rupibus secus maris oram, m. Sept. 1909, fruct.; comm. ex Hb. Manil.).

22. **ALECTRYON FUSCUS** Radlk.

Arbor?; rami teretes, fusci, glabri, innovationes tantum incano-tomentellae; folia 2–3-juga, petiolo rhachique latiusculis supra planis, subtus convexis; foliola ovalia vel superiora oblonga, subacuta, basi in petiolulos breviusculos attenuata, integerrima, chartacea, nervo mediano supra plano subtus convexo, nervis lateralibus subtus venisque reticulatis prominulis, utrinque glabra, laevia, nitidula, fusca, epidermide parum mucigera; panicula terminalis pauciramosa; flores- (non visi); fructus abortu 1-coccus, cocco subgloboso majusculo, pulverulento-tomentello, denique partim glabrato, quodammodo granulato, opaco, intus glabro; semen globosum, area inter arilli parum granulosi margines dorsali laevi angusta ovata.

Rami ca. 2 mm crassi. Folia petiolo 4 cm longo adjecto ca. 20 cm longa; foliola cum petiolulis 5 mm longis 7–12 cm longa, 3–4 cm lata. Paniculae 10 cm longae; pedicelli fructigeri 3–5 mm longi, prope basin articulati. Fructus cocci diametro 14 mm, pericarpio 1.5 mm crasso. Semina diametro 9 mm.

In Philippinarum insula Luzon: *G. P. Ahern n. 747* (prov. Bataan, Mariveles, m. Jan. 1902, fruct.; ex Hb. Manil. comm.).

23. **GUIOA FALCATA** Radlk.

Rami teretes, multistriati, apice petiolique thyrsique pilis sordide flavidis subhirsuti; folia pari-pinnata; foliola 6–8, subopposita, ex inaequilatere lanceolato subfalcata vel superiora sigmoideo-curvata, acute acuminata, in petiolulos conspicuos basi incrassatos attenuata, integerrima, subcoriacea, nervis lateralibus sat numerosis obliquis, supra glabra, subtus pilis subsetaceis flavescentibus adpressis undique sat dense adspersa et minutim tuberculato-papillosa (papillis supra stomata conniventibus), inde sordide opaca, efoveolata, cellulis secretoriis staurenchymatis lageniformibus, pneumatenchymatis globosis vel utriculiformibus obscure pellucido-punctata; rhachis foliorum nuda; paniculae axillares et terminales in unam diffusam congestae, ramis thyrsoideis cymulas stipitatas plurifloras pubescentes bracteis bracteolisque subulatis instructas gerentibus; flores breviter

pedicellati, pedicellis basi articulatis; sepala adpresse pubescentia; petala (4) obovato-spathulata, squamulis 2 cristatis villosis acuta; discus interruptus, semilunaris, glaber; stamina villosiuscula; pistilli rudimentam pilosum; fructus—(non suppetebant).

Arbor 25-pedalis, ramis longis expansis (Elmer in scheda). Rami foliigeri 3 mm crassi, cortice subfusco. Folia petiolo 2–3 cm longo adjecto 14–20 cm longa; foliola cum petiolulis 5 mm longis ad 10 cm longa, 2.5 cm lata. Panicula 14 cm longa, 10 cm lata; pedicelli vix 2 mm longi. Flores ca. 3 mm longi et lati, albi.

In Philippinarum insula Luzon: *Elmer n. 5869* (subprov. Benguet: Baguio, m. Mart. 1904, fl.; comm. ex Hb. Manil.).

24. **GUIOA RETICULATA** Radlk.

Rami teretes, striati, glabrati, cortice rubro-fusco, juveniles ut et folia novella utrinque pube densa sericea flavida induti; folia abrupte pinnata; foliola 4–8, alterna vel opposita, inaequilatere anguste ovato-lanceolata, latere interiore latiore, partim subfalcata, apice sensim acutata, basi in petiolulos conspicuos contracta, integerrima, margine linea cartilaginea flavida cincta et subrevoluta, subcoriacea, reti venarum arcto utrinque prominulo instructa, glabra, supra canescenti-, subtus flavescenti-viridia et dense breviter papillosa, 1-foveolata (foveola conspicua amplius aperta), impunctata; rhachis foliorum nuda; thyrsi ad apices ramorum axillares, cincinnigeri, pubescentes, vix folia dimidia aequantes; flores breviter pedicellati, bracteolis subulatis suffulti; sepala praeter marginem ciliolatum glabra; petala obovata, squamulis 2 cristatis dense villosis aucta; discus interruptus, glaber; stamina fere tota villosiuscula; pistilli rudimentum parce pilosum.

Rami 4 mm crassi. Folia petiolo 3–4 cm longo adjecto ad 12 cm longa; foliola cum petiolulis 3–5 mm longis 6–7 cm longa, infra medium 1.2–1.5 cm lata. Thyrsi 4 cm longi; pedicelli 2 mm longi. Flores expansi diametro 3 mm.

In Philippinarum insula Luzon: *Maximo Ramos n. 7055* (subprov. Abra, m. Jan.-Febr. 1909, fl.; comm. ex Hb. Manil.); *M. L. Merritt et F. W. Darling n. 14058* (prov. Ilocos Sur, m. Nov. 1908, alab.; Hb. Berol. ex Hb. Manil.).

25. **GUIOA SULPHUREA** Radlk.

Rami teretes, striolati, fusci, juveniles ut et petioli paniculaeque fulvo-pubescentes glandulisque microscopicis fuscis crebris adspersi, denique glabrati; folia pari-pinnata; foliola ca. 8, opposita, inaequilatere latiuscule ovato-lanceolata, latere interiore latiore longioreque, sensim acutata, petiolulis basi tumidis suffulta, in-

tegerrima, chartacea, nervis lateralibus utrinque 9–10 obliquis, juvenilia utrinque ut et rhachis pilis teneris glandulisque supra adspersa, adultiora supra ± glabrata laevia sordide flavescenti-viridia opaca, subtus molliuscula graciliter papillosa (papillis digitiformibus) sulphureo-opaca, basi 1-foveolata, impunctata; petiolus quam interjuga paullo longior, basi incrassatus, rhachis nuda; paniculae in axillis foliorum singulae vel paucae congestae, foliis dimidiis aliae longiores aliae breviores, pauciramosae, ramis thyrsoideis superne cincinnos breviter stipitatos 2–4-floros gerentibus fulvo-pubescentibus glandulisque minutis clavatis stipitatis crebris adspersis; bracteae bracteolaeque subulatae pilis glandulisque indutae; flores mediocres, ♂ et ♀ in iisdem cincinnis, breviter pedicellati; sepala late elliptica, praeter marginem glanduloso-ciliolatum glabra; petala 4 spathulata, intus 2-squamulata, 5.inter sepala 3.et 5.parvum, squama rudimentaria; discus semilunaris, glaber; stamina floris ♂ exserta, puberula; germen obovatum, triquetrum, ad angulos pilis perpaucis obsitum vel omnino glabrum.

Arbor 8-metralis. Rami 3 mm crassi. Folia petiolo 4.5 cm longo adjecto ad 25 cm longa; foliola cum petiolulis 5 mm longis 10–13 cm longa, 4 cm lata. Paniculae ad 16 cm longae; pedicelli 2–3 mm longi. Flores diametro 4 mm; germen 3 mm longum, stylo apice curvato 2 mm longo superatum.

In Philippinarum insula Luzon: *R. J. Alvarez n. 22429* (prov. Nueva Ecija, m, Nov. 1911, fl.; comm. ex Hb. Manil.).

26. GUIOA ACUMINATA Radlk.

Arbor mediocris; rami teretes, fusci, petiolique pedunculique glabri, innovationibus adpresse fulvo-pubescentibus; folia abrupte pinnata; foliola 6, ex oblongo lanceolata, subfalcata (latere interiore latiore), in acumen elongatum obtusiusculum nodulo terminatum protracta, basi in petiolulos attenuata, integerrima, submembranacea, obliquinervia, glabra, olivacea, utrinque nitidula, cellulis secretoriis crebris dense pellucido-punctata iisque subtus vel supra quoque prominulis sub lente minutim granulata, ceterum laevia (epapillosa), 1-foveolata, insignia epidermide paginae inferioris sparsim crystallophora; rhachis foliorum nuda; paniculae axillares, folia dimidia subaequantes, ramis minutim puberulis, cincinnos breviter stipitatos gerentibus; flores breviter pedicellati, sat magni; sepala praeter marginem ciliolatum glabra; petala elliptica, squamulis villosis aucta; discus glaber, tumidus, interruptus; stamina ultra medium villosula; flores ♀ fructusque non suppetebant.

Arbor 6–7-metralis. Rami 5 mm crassi. Folia petiolis 4–8 cm

longis adjectis ad 30 cm longa; foliola 10–15 cm longa, 3–4 cm lata, petiolulis 8 mm longis. Paniculae 10–12 cm longae; pedicelli 1.5 mm longi. Flores expansi diametro 4 mm.

In Philippinarum insula Luzon: *F. Tamesis n. 15356* (prov. Laguna, m. Nov. 1909; comm. ex Hb. Manil.); *M. Ramos n. 10916* (in ead. prov., San Antonio, m. Aug. 1910, fl.; comm. ex Hb. Manil.).

27. GLOEOCARPUS Radlk.

Flores unisexuales (non nisi ab insectis laesi visi), mediocres, regulares. Sepala 5, suborbicularia, concava, 2-seriatim imbricata, exterioribus 2 minoribus, subcoriacea, imo dorso pilis brevibus subsetaceis adpressis adspersa, intus margineque glabra, rubro-fusca, cellulis secretoriis gummi-resina flavida repletis orbicularibus pellucide punctata. Petala 5, sub disci margine inserta, perparva, ovalia, ciliolata, esquamulata, squamularum loco basi fasciculo pilorum marginali ornata, cellulis secretoriis orbicularibus paucis instructa. Discus regularis, annularis, glaber. Stamina 8, intra discum circa pistilli rudimentum 3-angulare ad angulos pilosum inserta, filiformia, infra apicem pilis latis compressis granulato-punctatis dense villosa; antherae breviter lateque ovata, glabriuscula, connectivo cellulis secretoriis instructo; pollinis granula triangulari-placentiformia, triporosa. Germen obovato-triquetrum, triloculare, in stipitem brevem attenuatum, glabrum, vix ad angulos pilis singulis adspersum; stylus mediocris, filiformis, curvatus, lineis stigmatosis 3 apice notatus; gemmulae in loculis solitariae, prope basin oblique erectae, compresse breviter ellipsoideae, micropyle extrorsum infera. Capsula subdrupacea, ex obverse pyramidato breviter 3-(raro 4-) gonopiriformis, breviter stipitata, styli basi breviter apiculata, glabra, flavida, 3(-4) -locularis, denique vix dubie loculicide dehiscens, epicarpio sicco rubro-fusco ruguloso, mesocarpio crassiusculo carnoso rubescente e cellulis utriculiformibus radialiter elongatis pauciseptatis conflato materia glutinoso-gummosa eodemque tannino affini (in aqua solubili, hic illic exsudata et guttulas exsiccatas pellucide sanguineas efformante) foeto cellulisque secretoriis parvis flavidis laxe persito, endocarpio lignoso-crustaceo. Semina trigono-ellipsoidea, testa tenuiter crustacea spadicea, arillo libero tenui dorso supra medium fisso vitellino tota obducta. Embryo notorrhizus, sordide viridis; cotyledones oleoso-carnosae, ab apice seminis deflexae, ventri apposita crassiore; radicula elongata, a summo dorso descendens, plica testae basali partim excepta.

Arbor mediocris. Rami exacte cylindrici, glabri, cortice laevi

fusco cellulis secretoriis persito. Folia abrupte pinnata, elongata, multijuga, sat petiolata, deflexa; foliola ad 26, subopposita, lineari-oblonga, acuta, in petiolulos breves inaequaliter angustata, margine exteriore a medio interiore fere a basi crenato-dentata, chartacea, nervis lateralibus utrinque ca. 13 procurvis in sinus inter dentes excurrentibus subtus prominentibus, praeter nervum medianum subtus puberulum glabra, nitidula, supra rubescentia, subtus olivacea, diachymate tanninigero cellulis secretoriis depresse ellipsoideis sat pachydermicis gummi-resina quadam foetis saepius ad utramque paginam epidermidi adpressis persito, inde tenuiora pellucido-punctata, epidermide non mucigera; petiolus rachisque supra planiuscula, subtus convexa, flavo-puberula, mox gabrata. Thyrsi mediocres, e trunco ramisque vetustioribus enascentes, solitarii vel pauci fasciculati, puberuli, sat dense cymulas breviter stipitatas paucifloras gerentes, bracteis bracteolisque minutis ovatis puberulis. Alabastra globosa, breviter pedicellata, pedicellis adpresse puberulis.

Species 1, philippinensis.

Genus affine generi "Cupaniopsis", insigne petalis minutis esquamulatis, sarcocarpio crassiusculo materia glutinoso-gummosa foeto, embryone viridi, radicula cotyledones longitudine subaequante.

(1) **G. CRENATUS** Radlk. Vulgo "Salab," quod nomen *Guioa Perrottetii* Radlk. quoque audit.

Character ut supra.

Arbor 8 m alta, trunco 15 cm crasso. Folia petiolo ca. 5 cm longo adjecto ad 40 cm longa; folio cum petiolulis 2–3, rarius 5–6 mm longis ad 12 cm longa, 2.5 lata. Thyrsi 8–10 cm longi. Sepala 2–2.5 mm, petala vix 0.8 mm longa, stamina 4–5 mm, antherae 0.8 mm longae. Capsula stipite 2 mm longo incluso 12–14 mm longa, totidem lata. Semen 8 mm longum, 5 mm crassum. — Habitu Cupaniopsin patentivalvem Radlk. in mentem revocat.

In Philippinarum insula Luzon: *H. M. Curran n. 17647* (prov. Laguna, San Antonio, in silvis, alt. 240 m, m. Febr. 1910; comm. ex Hb. Manil.).

28. **RHYSOTOECHIA ACUMINATA** Radlk.

Frutex(?); rami teretes, cortice fusco rugoso-striato; folia 1–4-juga, longiuscule petiolata; foliola subopposita, latiuscule lanceolata, utrinque acuminata, sat petiolulata, chartacea, nervis lateralibus procurvis, glabra, virescenti-flavida, supra nitida, subtus opaca, cellulis secretoriis nullis, glandulis basi immersis utrinque ornata, paginae inferioris cuticula granulata; thyrsi

axillares solitarii robusti et ad cicatrices foliorum delapsorum aequilongi solitarii vel bini terni congesti, racemiformes, (fructigeri) glabri; capsulae sat pedicellatae, obcordato-trilobae, in stipitem longiorem triquetrum attenuatae, abortu plerumque dispermae, glabratae, endocarpio glanduloso; semina elongato-ellipsoidea, e spadiceo nigro-fusca, splendida, arillo brevi crasso aurantiaco dorso depresso suffulta.

Rami 4–6 mm crassi. Folia petiolo ad 8 cm longo adjecto ad 40 cm longa; foliola 12–18 cm longa, 4–6 cm lata, petiolulis ca. 1 cm longis. Capsulae stipite ad 1 cm longo incluso 2.5 cm altae, fere totidem latae. Semina 18 mm longa, 8 mm crassa.

In Philippinarum insula Luzon: *A. Loher n. 5882* (prov. Rizal, Montalban, m. Apr. 1906, fr.; Hb. Kew., Monac.)

29. RHYSOTOECHIA STRIATA Radlk.

Frutex(?); rami teretes, striati, atro-fusci, parum lenticellosi, glabrati; folia 2–4-juga, longiuscule petiolata, petiolo subtereti striato, rhachi supra ± bisulcata, subtus convexa striata; foliola opposita vel subalterna, large elliptica, utrinque acuta, sat petiolulata, petiolulis crassiusculis rugosis, subcoriacea, nervis lateralibus sat approximatis e patulo procurvis, subtus retique venarum laxiore prominulis, glabra, flavescentia, nitidula, subtus viridia opaca, cellulis secretoriis sat raris (in specim. n. 778 perperam quaesitis) instructa, crystallis prope paginam superiorem baculiformibus crystallorumque concretionibus sat crebris persita, glandulis microscopicis cylindricis vel subclavatis interdum geminatim in epidermidis foveolas basi immersis sat crebris (sed plurimis decisis) utrinque ornata, epidermide paginae inferioris insigni cuticula granulata; thyrsi in foliorum axillis parvi vel in parte ramorum inferiore fasciculati majores, glabriusculi, cymularum loco flores singulos longuis pedicellatos gerentes; alabastra globosa; sepala 5, ciliata; petala 5, e late obovato in unguem brevem contracta, basi margine paullulum inflexo villoso subsquamulata; stamina 8, filamentis praeter apicem furfuraceo-villosis, antheris puberulis; germen (floris ♂) rudimentarium, 3-loculare, pilosum. Capsula obcordato-3-loba, sat stipitata, glabrata, endocarpio glanduloso.

Rami ca. 4 mm crassi. Folia petiolo 5–10 cm longo adjecto 30–40 cm el ultra longa; foliola ad 30 cm longa, 11.5 cm lata, petiolulis ca. 1 cm longis. Thyrsi 6–10 cm longi. Pedicelli ad 5 mm longi, basi articulati. Alabastra diametro 3 mm. Flores expansi diametro 5 mm. Capsula 2.2 cm alta, totidem lata.

In Philippinarum insula Mindanao: *Mary Strong Clemens n. 778* (Malabang, prov. Cotabato, m. Nov. 1906, alab.), *978* (Camp Keithley, Lake Lanao, m. Mart. 1907, alab. ♀), *1067* (ibid., m. Maj. 1907, flor. ♂), *"K"* (ibid. alt. 800 m, m Maj. 1906, fruct.; omnia comm. ex Hb. Manil.)

Maxime affinis Rh. ramiflorae Radlk., a Beccari in Celebes lectae.

30. **TRIGONACHRAS OBLIQUA** Radlk.

Arbor; rami apice thyrsique ochraceo-tomentosi; folia abrupte pinnata, petiolo rhachique teretiusculis sufferrugineo-tomentellis; foliola 11–15, opposita, ovato-lanceolata, subfalcata, apice acuta, basi oblique inaequilatera (latere exteriore breviore et angustiore), petiolulis sat longis ferrugineo-tomentosis dein glabrescentibus insidentia, chartacea, nervis lateralibus procurvis utrinque prominulis, glabra nec nisi subtus ad nervi mediani basin et partem vicinam ferrugineo-hirsuta, praesertim supra nitida, laevigata, subtus in axillis nervorum interdum glandulis maculiformibus notata, crebre pellucido-punctata, epidermide mucigera; thyrsi folia subaequantes, axillares, ad ramorum apices congesti, ramulis 1–3 aucti indeque in paniculas transeuntes, pedunculo nunc brevi nunc elongato, rhachi laxiuscule cincinnigera, cincinnis breviter stipitatis paucifloris; flores generis sat pedicellati, calycis segmentis ovatis obtusis ochraceo-tomentosis; fructus-(non visus nisi juvenilis, potius germen auctum, clavatum, tomentosum).

Folia petiolo 5–6 cm longo adjecto 20–36 cm longa; foliola cum petiolulis 4–5 mm longis 8–10 cm longa, 3–3.5 cm lata. Thyrsi ad 25 cm longi. Flores 2–2.5 mm longi, 3 mm lati, pedicelli 3 mm longi.

In Philippinarum insula Luzon: *A. Bernardo n. 13108* (prov. Cagayan, m. Maj. 1909, fl.; comm. ex Hb. Manil.).

31. **TRIGONACHRAS RIGIDA** Radlk. Vulgo "Balacatan" in lingua Tagalog t. Merrill in sched. n. 2967.

Arbor; rami teretiusculi, striati, glabri; folia abrupte pinnata, petiolo rhachique teretiusculis glabris; foliola minora, 8–10, opposita, ovato-lanceolata, subfalcata, apice valde acuta, basi inaequilatera (latere exteriore breviore et angustiore), sat petiolulata, rigidiuscule coriacea, nervis lateralibus procurvis utrinque prominulis, subtus in axillis nervorum glandulis maculiformibus raris notata, glabra, utrinque nitida, vix pellucido-punctata (attamen cellulis secretoriis, etsi parcioribus, instructa), epidermide mucigera; thyrsi ad ramorum apices axillares, folia subaequantes, ramulo uno alterove aucti, pedunculo longiusculo, glabri nec nisi apice minutissime adpresse pub-

eruli, basi interrupte, apice densius cincinnigeri, cincinnis vix stipitatis paucifloris; flores generis sat pedicellati, calyce (alabastri ♂) supra basin quodammodo constricto adpresse puberulo, petalis ovatis albidis pellucido-punctatis intus 2-squamulatis, antheris clavatis basi puberulis apice glandula dorsali impressa notatis, germine rudimentario trigono-globoso brevissime stipitato adpresse pilosulo; capsula minor, trigono-pyriformis, infra partem seminiferam obovoideam in stipitem contracta, apiculata, angulis obtusis, rugosa, pilis brevissimis adspersa, intus sufferrugineo-tomentosa; semen teretiusculum, exarillatum.

Rami 5 mm crassi. Folia petiolo 3–4 cm longo adjecto 14–18 cm longa; foliola cum petiolulis 6–8 mm longis 7.5–9.5 cm longa, 2.5–3 cm lata. Thyrsi pedunculo 3–4 cm longo incluso ca. 15 cm longi. Pedicelli fructigeri 5 mm longi. Capsula 2.5 cm longa, 1.5 cm lata.

In Philippinarum insula Luzon: *Merrill n. 2967* (prov. Zambales, Botolan, m. Maj. 1903, fr.; comm. ex Hb. Manil.); *F. W. Darling n. 18727* (prov. Camarines, Paracale, m. Mart. 1910, alab.; comm. ex Hb. Manil.).

32. TRIGONACHRAS MEMBRANACEA Radlk.

T. spec. Vidal Cat. Herb. (1892) p. 54, coll. *n. 2488* ins. Ticao, *n. 2500* ins. Panay (prov. Iloilo, Miagao).

Arbor elata; rami teretes, striati, glabri, cellulis sclerenchymaticis fibrosis transversalibus sub epidermide coacervatis albide punctati et lineolati; folia abrupte pinnata, petiolo longiusculo rhachique teretiusculis glabris; folioła majuscula, 12–16, subopposita, lanceolata, parum inaequilatera, subfalcata, acuta, sat petiolulata, e chartaceo submembranacea, nervis lateralibus procurvis utrinque prominulis, glabra, praesertim supra nitida, subtus in axillis nervorum glandulis maculiformibus notata, sat crebre pellucido-punctata, epidermide mucigera; thyrsi ad ramorum apices congesti, laterales, ramis paucis incurvis aucti, elongati, pedunculo longiusculo glabro, rhachi superne sufferugineo-tomentella sat dense cincinnigera, cincinnis vix stipitatis; fructus (immaturus tantum visus) trigono-pyriformis, infra partem seminferam obovoideam in stipitem contractus, apiculatus, angulis obtusis, tomento brevi denso e sufferrugineo canescente indutus, intus ochraceo-tomentosus.

Arbor 22 m alta. Rami 4–5 mm crassi. Folia petiolo 5–6 cm longo adjecto 28–45 cm longa; foliola cum petiolulis 5–7 mm longis 9–13 cm longa, 3–5 cm lata. Thyrsi cum pedunculo ad 9 cm longo 20–28 cm longi. Pedicelli fructigeri 5 mm longi.

In Philippinarum insulis Ticao et Panay; in Ticao: *Vidal n. 2488* (fr. immat.; Hb. Kew.); *W. W. Clark n. 1073* (m. May. 1904, fr. immat.; comm. ex Hb. Manil.);—in Panay: *Vidal n. 2500* (Miagao, prov. Iloilo, fl.; Hb. Kew.).

33. **TRIGONACHRAS SPECTABILIS** Radlk.

Arbor sat alta; rami striati, apice thyrsique ferrugineo-tomentelli; folia magna, elongata, abrupte pinnata, petiolo mediocri supra planiusculo subtus convexo striato glabrato; foliola ca. 18, subopposita, ovato-lanceolata, acuta, inaequilatera, basi obliqua, breviuscule petiolulata, chartacea, nervis lateralibus procurvis utrinque prominulis, glabra, supra nitida, subtus opaca et in axillis nervorum glandulis maculiformibus notata, flavescenti-viridia, crebre pellucido-punctata, epidermide mucigera; inflorescentiae ad apicem ramorum axillares, foliis breviores, ramificatae, ramis thyrsoideis cincinnigeris, cincinnis breviter stipitatis; flores—non suppetebant nisi partes sub fructu relictae: calyx breviter cupularis segmentis parvis deltoideis extus et intus ferrugineo-tomentellis, discus annularis, glaber; capsula inter generis minores sat magna, trigono-pyriformis angulis acutiusculis, stipitata, apiculata, ferrugineo-tomentella, exocarpio crassiusculo saponinigero, endocarpio sclerenchymatico laxiuscule rufescenti-piloso; semina ovalia, a dorse convexo compressiuscula, ventre obtusangula, testa tenuiter crustacea laevissima splendida fusco-spadicea, basi hilo transversim elliptico albido notata, arillo nullo; embryo viridulus.

Arbor 15 m alta, trunco 30 cm crasso. Rami inflorescentias gerentes 1 cm crassi. Folia petiolo 5 cm longo adjecto ad 42 cm longa; foliola cum petiolulis 3 mm longis ad 14 cm longa, 5 cm lata. Pedicellus fructiger 1 cm longus. Capsula 3 cm longa, ad 2 cm lata. Semen 11 mm longum, 7 mm latum, 6 mm crassum.

In Philippinarum insula Mindanao: *C. M. Weber 1194* (in subprovincia Butuan, ad Veruela in silvis, m. Jun. 1911, fr.; comm. ex Hb. Manil.).

34. **GONGROSPERMUM** Radlkofer

Flores unisexuales (♀ tantum visi, hermaphroditos mentientes), parvi, perbreviter pedicellati. Calyx breviter cupularis, 5-sectus, segmentis deltoideis, utrinque sufferrugineo-tomentellis. Petala 0. Discus subcupularis, tomentosus, pressione staminum crenulatus. Stamina 8, filamentis perbrevibus superne villosis, antheris ellipsoideis crassiusculis 4-sulcatis glabris fuscis lateraliter dehiscentibus; pollinis granula trigono-placentiformia, 3-sulcata, 3-porosa. Germen ovatum, trigonum, tomento-

sum, apice glabrum subtrilbo-stigmatosum, 3-loculare; gemmulae in loculis solitariae, erectae, apotropae, campylotropae, micropyle extrorsum infera. Capsula in ramulo sympodiali brevi ± glabrato terminalis, pedicello brevissimo suffulta, pyriformis, in stipitem brevem sulcis staminum insertionibus respondentibus notatum attenuata, breviter apiculata, sufferrugineo-tomentosa, abortu plerumque 1-locularis, ad latus loculis effoetis compressis respondens ± applanata, denique loculicide dehiscens, pericarpio corticoso cellularum sclerenchymaticarum concretionibus crebris instructo et cellulis secretoriis substantiam oleoso-resinosam foventibus persito, endocarpio sclerenchymatico transversim fibroso pilis adpressis praesertim basi prope seminis insertionem (in loculis effoetis vero undique densius) obsito; semen ad loculi angulum centralem prope basin insertum, obovatum, a lateribus compressiusculum, atro-fuscum, glabrum, exarillatum, testa crustacea laevi intus in protuberantias nodosas partim literae T figuram aemulantes versus seminis centrum protrusas (quodammodo illis in Anonacearum seminibus endospermium ruminatum efficientibus similes) producta (unde generis nomen). Embryo curvatus (ut videtur, notorrhizus), cotyledonibus (in semine observato nondum plane evolutis tenuibus) testae protuberantiis arcte applicitis, radicula in seminis dorso descendente plica testa profunda excepta.

Arbor; rami teretiusculi, superne 5-sulcati, ut et petioli paniculaeque pilis brevibus basi dilatata collapsis hyalinis ceterum materie fusca repletis sufferrugineo-tomentelli. Folia abrupte pinnata, longiuscule petiolata, petiolo supra sulco exarato subtus convexo striolato; foliola 5–6, larga, subopposita, late elliptica, breviter obtuse acuminata, in petiolulos longiusculos basi incrassatos abruptius attenuata, integerrima, chartacea, nervis lateralibus utrinque ca. 9 oblique vel superioribus arcuatim adscendentibus, subtus prominentibus, glabra, utrinque opaca, supra pallide subfusca, subtus viridula, ad paginam superiorem hypodermate hic illic interrupto tannino crystallisque destituto instructa, diachymate praeter strata inferiora chlorophyllophora tanninigero cellulis secretoriis parvis substantiam oleoso-resinosam gerentibus laxe persito, epidermide non mucigera. Paniculae axillares, sat amplae, ramis thyrsoideis dense cincinnos sessiles glomeruliformes gerentibus, bracteis bracteolisque perparvis ovatis obtusiusculis. Alabastra globosa, sessilia.

Species 1, philippinensis.

Genus calyce parvo et semine exarillato accedens ad genus

"Trigonacharas", recedens testae seminis indole, pericarpio saponino destituto, petalis 0, foliorum epidermide non mucigera hypodermate suffulta.

(1) G. PHILIPPINENSE Radlk.

Character ut supra.

Rami 5 mm crassi. Folia petiolo 6–9 cm longo adjecto 35 cm longa; foliola cum petiolulis 10–12 mm longis ad 20 cm longa, 9 cm lata. Paniculae folia subaequantes. Flores diametro vix 2 mm. Capsula stipite vix 2 mm longo incluso 1.5 cm longa, 1 cm lata, pericarpio ad 1 mm crasso. Semen 8 mm longum, 5 mm latum, 3 mm crassum.

In Philippinarum insula Luzon: *R. C. McGregor n. 12358* (prov. Laguna, Calauan in silvis, m. Nov.–Dec. 1910, fr.; comm. ex Hb. Manil.).

35. MISCHOCARPUS CAULIFLORUS Radlk.

Arbor; folia abrupte pinnata, petiolo supra plano, rhachi subterete striata; foliola ca. 9, alterna, decrescentim minora, ex oblongo subcuneata, breviter acuminata, basi subacuta, petiolulata, integerrima, membranaceo-chartacea, glabra nec nisi pilis raris adpressis (glandulisque microscopicis cylindricis) subtus adspersa, nervis patulis subtus prominentibus, reti venarum sat angusto supra subtusque prominente, (sicca) sordide viridia, cellulis secretoriis creberrimis dense pellucide punctata et lineolata, epidermidis inferioris cellulis sparsim crystalla singula gerentibus; thyrsi vel paniculae pauciramosae (ramis thyrsoideis) e trunco enascentes, laxiflori; flores (fructigeri) in cincinnis sessilibus contractis sat pedicellati, (quantum e cicatricibus sub disco obviis concludi potest) petaligeri; sepala 5, deltoidea, glabriuscula; discus glaber; capsula abortu 1-sperma, clavato-pyriformis, in stipitem quam pars seminifera obovoidea breviorem trigonum contracta, styli conspicui reliquiis apiculata, glabra, reticulato-rugosa, mesocarpio cellulis resinigeris crebris foeto, endocarpio fere toto sclerenchymatico glabro; semen ellipsoideum, testa tenui spadicea praeter aream supra medium dorsalem tota arillo calcarato obtecta.

Folia petiolo 8 cm longo adjecto ad 50 cm longa; foliola cum petiolulis 5–7 mm longis 12–22 cm longa, 5–7 cm lata. Thyrsi 10–16 cm longi; pedicelli (fructigeri) 5 mm longi, basi articulati. Sepala 2 mm longa. Fructus stipite 7 mm longo adjecto 2 cm longus 12 cm latus, rubro-fuscus; semen 12 mm longum, 10 mm latum.

In Philippinarum insula Mindoro: *R. C. McGregor n. 271* (Baco River, m. Apr.–Maj. 1905, fr.; comm. ex Hb. Manil.).

36. MISCHOCARPUS BRACHYPHYLLUS Radlk.

Frutex vel arbor parva; rami teretes, rugoso-striati, glabri; folia abrupte pinnata, petiolo sat longo rhachique teretiusculis striatis; foliola 4–6, subopposita vel alterna, brevia (lamina vix vel ne vix duplo longiore quam lata), ovali-lanceolata, nunc obtusa, nunc sensim subacuminata, in petiolulum longiusculum abruptius attenuata, integerrima, coriacea, glabra nec nisi glandulis microscopicis adspersa, nervo mediano valido subtus prominente, lateralibus procurvis subtus obsolete prominulis in axillis raro foveola urceolata notatis, subfusca, nitida, subtus opaca anguste reticulato-venosa, cellulis secretoriis nullis indeque impunctata, epidermidis superioris hypodermate suffultae cellulis septis singulis verticalibus interceptis, inferioris cellulis sparsim crystalla singula gerentibus; paniculae breviusculae vel folia subaequantes ad ramorum apices congestae, pauciramosae, florigerae nutantes, fructigerae strictae, minutim puberulae, cymulis subsessilibus vel breviter stipitatis sat dense obsitae; flores sat pedicellati; sepala deltoidea, minutim puberula; petala minima, esquamata, partim obsoleta; discus minutim puberulus, denique glabratus; staminum filamenta densius, antherae laxius puberulae; germen trigonum, tomentellum; capsula abortu monosperma (stipite mediocri excluso) ovoidea, apiculata, glabra, intus pilis longis leptodermicis multicellularibus vestita, mesocarpio crassiusculo resinoso-carnoso, endocarpio fere toto (loculi fertilis striis angustis juxta septorum ortum exceptis) sclerenchymatico; semen ellipsoideum, testa chartacea badia ad medium vel ventre ultra medium arillo obtectum.

Frutex 2–metralis vel (t. Curran) arbor 6–metralis. Rami 5 mm crassi. Folia petiolo 2.5–4 cm longo adjecto 15–17 cm longa; foliola cum petiolulis 8–15 mm longis 8–12 cm longa, 3–5.5 cm lata. Paniculae 9–14 cm longae; pedicelli 3–5 mm longi, infra medium articulati. Capsula cum stipite 5 mm longo 1.5 cm longa, 8 mm crassa. Semen 1 cm longum, 7 mm crassum, e capsula aperta cupuliformi seminis basin arcte amplectente fere dimidium prominens.

In Philippinarum insula Luzon: *H. M. Curran n. 4858* (Baguio, prov. Benguet, alt. 1,500 m, m. Aug. 1906, fr.; comm. ex Hb. Manil., ut et seq.); M. Vanoverbergh n. 1175 (Bauco, subprov. Bontoc, alt. 1,680 m, m. Mart.–Maj. 1911, fl.).

Species endocarpii indumento peculiari foliorumque hypodermate insignis.

37. **HARPULLIA MACROCALYX** Radlk.
H. spec. Vidal Cat. Herb. (1892) quoad n. 2525!

Arbor magna; rami teretes, cortice fusco-cinereo, glabri; folia 3–4-juga, petiolo rhachique glabris; foliola elongate angusteque oblonga, acuta, basi (praesertim superiora) cuneata, in petiolulum longiusculum sensim attenuata, nervis lateralibus parum approximatis oblique adscendentibus, subtiliter venosa, glabra, supra laevia, utrinque nitida, fusco-viridia, cellulis secretoriis ad paginam superiorem subepidermalibus instructa, epidermide mucigera; thyrsi ad apices ramulorum axillares, solitarii vel gemini, foliorum dimidiam vel tertiam tantum partem vel vix petiolum aequantes, ut et sepala sufferrugineo-tomentelli, basi interdum ramosi, sat dense dichasia breviter stipitata 3-flora vel superne flores singulos bibracteolatos gerentes; capsula cordata, breviter stipitata, styli reliquiis apiculata, laeviuscula, rubra, sicca nigrofusca, glabrata, intus pilis non nisi raris adspersa, pericarpio crustaceo-sublignoso, epithelio tenui.

Rami 4–6 mm crassi. Folia petiolo 5–8 cm longo adjecto 20–30 cm longa; foliola cum petiolulis ad 1.5 cm longis 10–16 cm longa, 2.5–3.5 (rarius 4–5) cm lata. Thyrsi 6–15, raro 18 cm longi; bracteae bracteolaeque subulatae, 3–4 mm longae. Sepala (sub fructu relicta) oblonga, 5–7 mm longa; discus hirsutus. Capsula 1.8 cm longa, 2.3–3 cm lata. Semina obovoidea, arillo (sicco) aurantiaco circa apicem obtusum truncato obtecta, testa chartacea spadicea; embryo olivaceo-fuscus, cotyledonibus transversim superpositis, radicula a medio dorso descendente, complanata, plica testae levi excepta.

In Philippinarum insula Luzon: *A. Loher n. 5891* (Montalban, prov. Rizal, m. Aug. 1905, fruct.). Huc quoque vix dubie recensenda videtur: *Vidal n. 2525* (San Antonio, prov. Isabela de Luzon, fr.; thyrsi breves; Hb. Kew.).

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ENUMERATION OF PHILIPPINE FUNGI WITH NOTES AND DESCRIPTIONS OF NEW SPECIES, II

By H. and P. SYDOW

(*Berlin, Germany*)

Seven text figures

UROMYCES Link

UROMYCES LINEARIS Berk. & Br.

LUZON, Manila and vicinity, *Bur. Sci. 20638 Graff*, March 4, 1913, on leaves of *Panicum repens:* Province of Bataan, Lamao, *Merrill S 138*, February 3, 1913, on leaves of the same host: Province of Laguna, Los Baños, *Baker 785*, February 1, 1913, on leaves of *Panicum flavidum.*

UROMYCES HEWITTIAE Syd.

LUZON, Province of Bataan, Lamao, *Merrill S 141*, February 3, 1913, on leaves of *Hewittia sublobata* (*H. bicolor*).

PUCCINIA Persoon

PUCCINIA EREBIA Syd. sp. nov.

Soris teleutosporiferis amphigenis, plerumque epiphyllis, sine maculis, irregulariter sparsis vel aggregatis, rotundatis vel irregularibus, minutis vel confluendo majoribus, 0.3–1 mm diam., epidermide fissa cinctis, pulverulentis, atris; teleutosporis ellipsoideis vel oblongo-ellipsoideis, utrinque late rotundatis, medio modice constrictis, ubique dense verrucosis, obscure castaneo-brunneis, 43–60 μ longis, 25–30 μ latis, episporio 3.5–4.5 μ crasso; pedicello persistenti, crasso, hyalino, usque 70 μ longo.

LUZON, vicinity of Manila, *Merrill S 150*, February 22, 1913, on leaves of *Clerodendron commersonii* (type): Province of Bataan, Lamao, *Merrill 8689*, January, 1913, on leaves of *Clerodendron minahassae.*

PUCCINIA ENGLERIANA P. Henn.

LUZON, Province of Laguna, Los Baños, *Baker 1019*, April 20, 1913, on leaves of *Tabernaemontana pandacaqui.*

PUCCINIA HETEROSPORA B. et C.

LUZON, Manila and vicinity, *Merrill 8590*, February 24, 1913, on leaves of *Sida veronicaefolia.*

PUCCINIA PHILIPPINENSIS Syd.

LUZON, Manila and vicinity, *Bur. Sci. 20650 Graff*, February, 1913, *Graff comm. Merrill S 163*, on leaves of *Cyperus rotundus.*

HEMILEIA Berkeley et Broome

HEMILEIA CANTHII Berk. et Br.

LUZON, Manila and vicinity, *Merrill 8564*, January, 1913, on leaves of *Plectronia* (*Canthium*) *peduncularis*.

HEMILEIA VASTATRIX Berk. et Br.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20268 McGregor*, January, 1913, on leaves of *Coffea arabica*.

SCHROETERIASTER P. Magnus

SCHROETERIASTER CINGENS Syd.

LUZON, Province of Bataan, *Bur. Sci. 19019, 19021 Graff*, November, 1912, on leaves of *Bridelia tomentosa* (Uredo stage only).

KUEHNEOLA P. Magnus

KUEHNEOLA GOSSYPII Arth.

Uredo gossypii Lagerh. Journ. Myc. 7 (1891) 48.

LUZON, Province of Laguna, Los Baños, *Baker 871*, March 12, 1913, on leaves of *Gossypium herbaceum:* vicinity of Manila, *Merrill S 143*, January 26, 1913, on leaves of *Gossypium brasiliense*.

COLEOSPORIUM Léveillé

COLEOSPORIUM MERRILLII P. Henn.

LUZON, Subprovince of Benguet, Baguio, *Baker 1169* coll. *Copeland*, May, 1913, on leaves of *Spathoglottis chrysantha*.

UREDO Persoon

UREDO OPERCULINAE Syd. sp. nov.

Soris uredosporiferis hypophyllis, sparsis, rotundatis, minutis, 0.2–0.5 mm diam., epidermide fissa cinctis, pulverulentis, cinnamomeis; uredosporis globosis, subglobosis, vel ovatis, breviter echinulatis, flavo-brunneis vel brunneis, 20–26 μ longis, 16–22 μ latis, episporio 1.5–2.5 μ crasso.

LUZON, Manila and vicinity, *Merrill 8385*, September, October, 1912, on leaves of *Operculina turpethum*.

UREDO NERVISEDA Syd. sp. nov.

Soris uredosporiferis in greges irregulares ca. 2 mm diam. vel elongatos usque 1 cm longos dispositis, fere semper nervisedis, minutis, 0.3–0.5 mm latis, epidermide fissa cinctis, pulverulentis, cinnamomeis; uredosporis subglobosis vel ovatis, remote aculeatis, brunneis, 26–37 μ longis, 20–28 μ latis, episporio 1.5–2.5 μ lato, poris germinationis 3 magnis praeditis.

LUZON, Province of Laguna, Los Baños, *Baker 1026*, April 20, 1913, on leaves of *Wedelia biflora*.

The new species is quite distinct from *Uredo Wedeliae-biflorae* Syd.

UREDO ANTIDESMAE-DIOICAE Rac.

LUZON, Manila and vicinity, *Merrill 8552*, January, 1913, on leaves of *Antidesma ghaesembilla.*

UREDO NGAMBOENSIS P. Henn.

LUZON, Province of Bataan, Lamao, *Merrill 8683*, January, 1913, on leaves of *Albizzia lebbeck.*

UREDO ABRI P. Henn.

LUZON, vicinity of Manila, *Merrill S 146*, January 25, 1913, on leaves of *Abrus precatorius.*

AECIDIUM Persoon

AECIDIUM LAGUNENSE Syd. sp. nov.

Pycnidiis amphigenis, flavo-brunneis; aecidiis hypophyllis, in greges orbiculares 1–2 cm latos densiuscule dispositis, maculis flavidis insidentibus, cupulatis, flavis, margine recurvato crasse inciso; cellulis contextus 24–35 μ longis, 22–30 μ latis, pariete exteriore usque 10 μ incrassato et papillis crassis obtusis obsito; aecidiosporis globosis vel angulato-globosis, 23–26 μ diam., episporio hyalino dense verrucoso-striolato 3–4 μ crasso, hinc inde usque 9 μ incrassato, contentu aurantiaco.

LUZON, Province of Laguna, Los Baños, *Baker 1159, 1228*, April, 1913, on living leaves of *Telosma.*

AECIDIUM CLERODENDRI P. Henn.

LUZON, Manila and vicinity, *Merrill 8570*, January, 1913, on leaves of *Clerodendron intermedium.*

AECIDIUM MACHILI P. Henn.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8675*, March, 1913, on leaves of *Machilus.*

AECIDIUM PAEDERIAE Diet.

LUZON, Manila and vicinity, *Merrill 8566*, January, 1913; *Merrill S 137*, February 10, 1913, on leaves of *Paederia tomentosa.*

AECIDIUM PHYLLANTHINUM Syd.

LUZON, Manila and vicinity, *Merrill 8581*, February 22, 1913, on leaves of *Phyllanthus reticulatus.*

AECIDIUM NUMMULARE Berk.

LUZON, Province of Laguna, Los Baños, *Baker 742*, January 20, 1913, on leaves of *Ceropegia.*

GRAPHIOLA Poiteau

GRAPHIOLA CYLINDROSPORA Syd.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8429*, November, 1912; and *Merrill 8670*, March, 1913, on leaves of *Livistona.*

EUROTIUM Link

EUROTIUM REPENS De Bary

LUZON, Province of Rizal, Antipolo, *Ramos comm. Merrill S 122*, October, 1912, on leaves of *Antidesma ghaesembilla* associated with an undeveloped *Capnodium*.

DIMERIELLA Spegazzini

DIMERIELLA CYATHEARUM Syd. sp. nov.

Subiculo hypophyllo, superficiali, atro, velutino, crasso, ex hyphis 5–6 μ crassis obscuris remote septatis et vix vel parum ramosis composito; peritheciis superficialibus, globosis, astomis, 120–180 μ diam., ubique pilis subrectis vel flexuosis obscure brunneis remote septatis 40–100 μ longis et 5–6 μ crassis obsitis, contextu opaco ex cellulis minutis 5–7 μ diam., parenchymatice composito; ascis clavatis, apice rotundatis, subsessilibus, copiose paraphysatis, 60–70 μ longis, 14–16 μ latis, octosporis; sporidiis distichis, oblongis, medio 1-septatis, non constrictis, hyalinis, 14–18 μ longis, 4–5 μ latis, cellula superiore paullo latiore.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8638*, March, 1913, on leaves of *Cyathea caudata*.

PARODIELLA Spegazzini

PARODIELLA GRAMMODES (Kze.) Cke. (=*P. perisporioides*).

PANAY, Province of Iloilo, *Bur. Sci. 18097 Robinson*, December 27–31, 1912, on leaves of *Desmodium capitatum*. LUZON, vicinity of Manila, *Merril S 148*, January 11, 1913, on leaves of *Desmodium triflorum*.

MELIOLA Fries

MELIOLA MITRAGYNES Syd. sp. nov.

Mycelio amphigeno plerumque epiphyllo, tenuiter effuso, laxo, ex hyphis longiusculis parce ramosis fusco-brunneis 7–9 μ latis composito; hyphopodiis capitatis numerosis, alternantibus, ovatis vel oblongis, rectis vel leniter curvatis, 12–17 μ longis, 9–13 μ latis, cellula basali minuta, superiore globosa, rotundata, hyphopodiis mucronatis, plerumque oppositis, ampulliformibus, usque 26 μ longis; setis mycelicis numerosis, simplicibus, rectis vel leniter curvatis, apice acutis, inferne opacis, apicem versus plus minus dilutioribus, 300–425 μ longis, 7–9 μ latis; peritheciis sparsis, globosis, atris, glabris, 150–180 μ diam., in sicco collapsis, ascis ovatis, bisporis, 44–50 μ longis, 25–30 μ latis, sporidiis cylindraceis, 4-septatis, ad septa leniter constrictis, utrinque late rotundatis, obscure brunneis, 35–42 μ longis, 14–16 μ latis.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20253, 20272 McGregor*, January, 1913, on living leaves of *Mitragyne diversifolia*.

MELIOLA MERRILLII Syd. sp. nov.

Epiphylla, subpelliculosa, atra, velutina, primitus maculas 2–8 mm diam. formans, dein confluens et plus minusve effusa; mycelio ramoso, anastomosante, fusco-brunneo, ex hyphis septatis 8–10 μ crassis composito; hyphopodiis capitatis numerosis, alternantibus, 20–26 μ longis, cellula basali brevi, superiore globulosa vel lenissime lobata, crassa, 11–14 μ lata; hyphopodiis mucronatis rarioribus, oppositis, ampulliformibus, usque 24 μ longis; setis mycelicis numerosissimis, erectis, basi geniculatis, 160–220 μ longis, 9–11 μ latis, septatis, opacis vel subopacis, superne in ramos duos patentes 35–70 μ longos divisis, ramis ad apicem sive tantum bi- tridentatis (dentibus 3–10 μ longis), sive rarius iterum in ramulos duos divisis et ramulis his ad apicem breviter bi- tridentatis, peritheciis sparsis, globosis, levibus, 140–175 μ diam.; ascis ovatis, 2–3-sporis, fugacibus; sporidiis oblongis, 4-septatis, ad septa constrictis; fuscis, utrinque late rotundatis, 34–38 μ longis, 12–14 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8672*, March, 1913, on living leaves of *Cissus* (? *adnata*).

Meliola Merrillii at first forms small patches which, however, soon run more or less together. It is most nearly related to *M. patens* Syd., especially in the ramification of the mycelial setae, but differs in its external appearance, in the smaller, not rugose perithecia and by the smaller sporidia.

MELIOLA PEREGRINA Syd. sp. nov.

Amphigena, maculas atras minutissimas 0.33–1.5 mm diam. orbiculares formans; mycelio ex hyphis radiantibus ramosis longiusculis castaneo-brunneis septatis 7–9 μ crassis formato; hyphopodiis capitatis innumeris, densissime stipatis, alternantibus, obscure brunneis, 12–17 μ longis, 10–12 μ latis, cellula superiore late rotundata, inferiore brevi; hyphopodiis mucronatis rarissimis; setis nullis; peritheciis plerumque solitariis in quaque macula, rotundatis, applanatis, atris, ostiolatis, 200–300 μ latis, contextu opaco indistincte hyphoideo; ascis ovatis, bisporis, 45–54 μ longis, 25–35 μ latis; sporidiis oblongis, utrinque late rotundatis, 4-septatis, ad septa constrictis, obscure fuscis, 34–41 μ longis, 12–16 μ latis.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20255 McGregor*, January, 1913, on living leaves of *Maesa laxa*.

The species differs from nearly all representatives of the large genus *Meliola* by the flat perithecia of a rather hyphoid tissue. It agrees in this respect somewhat with *M. clavispora* Pat.

MELIOLA PERPUSILLA Syd. sp. nov.

Ephiphylla, rarius caulicola, maculas minutissimas 0.4–1 mm latas atras efformans; mycelio radiante ex hyphis longis remote ramosis brunneis 8–10 μ satis composito; hyphopodiis capitatis tereti-cylindraceis, rectis, erectis, brunneis, 16–24 μ longis, 8.5–10 μ latis, cellula basali minuta; hyphopodiis mucronatis non visis; setis mycelicis simplicibus, rectis vel leniter flexuosis, apice acutis, inferne subopacis, sursum plerumque pellucidis, 200–320 μ longis, 8–10 μ latis; peritheciis 1–4 in quaque macula, globosis, atris, in sicco profunde umbilicatis, 100–150 μ diam., contextu perenchymatico ex cellulis 8–10 μ diam. composito; ascis ovatis, 2–4-sporis, 30–42 μ longis, 20–30 μ latis, sporidiis oblongis, utrinque late rotundatis, 4-septatis, ad septa leniter constrictis, fuscis, 24–28 μ longis, 11–13 μ latis.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20257 McGregor*, January, 1913, on living leaves and stems of *Tylophora*.

The species is well characterized by forming only very small spots, by the terete-cylindrical hyphopodia, and the small sporidia.

MELIOLA PELLICULOSA Syd. sp. nov.

Amphigena, foliorum superficiem pellicula plus minus continua aterrima facile separabili obducens; mycelio ex hyphis densissime intertextis obscure fuscis 7–9 μ crassis ramosis septatis composito; hyphopodiis capitatis numerosissimis, breviter cylindraceis vel subclavatis, apice late rotundatis, 14–20 μ longis, 8–10 μ latis, fuscis, cellula basali brevi; hyphopodiis mucronatis rarioribus, ampulliformibus, usque 21 μ longis; setis mycelicis rectis, rigidis, apice acutis, simplicibus, opacis, superne subinde plus minus dilutioribus, 150–320 μ longis, 7–9 μ latis; peritheciis sparsis, minutis, globosis, tuberculatis, 100–130 μ diam.; ascis bisporis, ovatis, 40–50 μ longis, 25–35 μ latis; sporidiis oblongis, utrinque late rotundatis, 4-septatis, ad septa valde constrictis, obscure brunneis, 39–45 μ longis, 14–17 μ latis.

LUZON, vicinity of Manila, *Merrill S 155*, February 22, 1913, on living or languishing leaves of *Lumnitzera racemosa*.

In external appearance and microscopical characters the species agrees fairly well with *Meliola gymnosporiae* Syd. which, however, produces no setae.

MELIOLA CYLINDROPHORA Rehm.

Mycelio epiphyllo, rarius hypophyllo, maculas minutas 1–4 mm latas aegre conspicuas formante, laxo, radiante, ex hyphis longiusculis rectis ramosis fuscis 7–8 μ latis septatis composito; hyphopodiis capitatis numerosissimis, plerumque perfecte oppositis, cylindraceis, fere semper rectis et aequalibus, apice late

rotundatis, 11–16 μ longis, 8–9 μ latis, bicellularibus, cellula basali brevissima subinde vix conspicua; hyphopodiis mucronatis rarioribus usque 21 μ longis; setis mycelicis paucis, erectis, rectis, ad basim geniculatis, simplicibus, septatis, apice acutiusculis, inferne subopacis, apicem versus dilutioribus, 150–340 μ longis, 7–8 μ latis; peritheciis paucis vel solitariis in quaque macula, globosis, late umbilicatis, 120–170 μ diam.; ascis plerumque bisporis, ovatis; sporidiis oblongis, utrinque late rotundatis, 4-septatis, ad septa constrictis, 36–40 μ longis, 15–17 μ latis, fuscis.

LUZON, Province of Bataan, Lamao, *Merrill S 140*, February 3, 1913, on living leaves of *Caesalpinia nuga:* Province of Laguna, Mt. Maquiling, *Merrill 8437*, November, 1912, on leaves of *Itea maesaefolia.*

The foregoing description we have made from our material on *Caesalpinia nuga.* This form agrees in every respect with that on *Itea maesaefolia.*

MELIOLA QUADRISPINA Rac.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8655*, March, 1913, on leaves of ***Hewittia sublobata* (*H. bicolor*).**

MELIOLA PULCHERRIMA Syd.

LUZON, Province of Rizal, *Bur. Sci. 19313 Reillo*, December, 1912, on leaves of ***Eugenia jambolana.***

MELIOLA CLERODENDRICOLA P. Henn.

LUZON, Province of Bataan, Lamao, *Merrill 8688*, January, 1913, on leaves of ***Clerodendron minahassae.***

MELIOLA CONFRAGOSA Syd.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8606*, March, 1913, on leaves of ***Trichosanthes quinquangularis.***

MELIOLA DESMODII Karst. et Roum.

LUZON, Province of Bataan, *Bur. Sci. 19025 Graff*, November, 1912, on leaves of *Desmodium virgatum*, *Bur. Sci. 19058 Graff*, November, 1912, on leaves of ***Desmodium gangeticum.***

MELIOLA SUBSTENOSPORA v. Hoehn., forma.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8653*, March, 1913, on leaves of ***Oplismenus compositus.***

MELIOLA ARUNDINIS Pat.

PANAY, Province of Iloilo, *Bur. Sci. 18024 Robinson*, December 27–31, 1912, on leaves of *Saccharum* spec.

The specimen agrees fairly well with Patouillard's description. The setae, however, are thicker, about 13–16 μ, and black throughout their length.

MELIOLA GYMNOSPORIAE Syd.

LUZON, Manila and vicinity, *Merrill 8567*, January, 1913, on leaves of ***Gymnosporia spinosa.***

AITHALODERMA Sydow

AITHALODERMA CLAVATISPORUM Syd.

LUZON, Manila and vicinity, *Merrill 8550*, January, 1913, on leaves of *Antidesma bunius* (specimen immature): Province of Laguna, Los Baños, *Baker 1163*, April 17, 1913, on leaves of *Psidium guajava;* same locality, *Baker 1222*, April 22, 1913, on leaves of *Sandoricum indicum.*

The specimen on *Sandoricum* agrees perfectly with the type as described and figured in Ann. Myc. 11 (1913) 258. The specimen on *Psidium* differs in having the perithecia beset with fewer or only with a single but much longer (up to 100 μ) bristle. Perhaps this form must be regarded as a distinct species.

ENGLERULA P. Hennings

ENGLERULA MEDINILLAE (Rac.) v. Hoehn.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8439*, November, 1912, on leaves of *Medinilla myriantha*, and *Merrill 8644*, March, 1913, on leaves of *Medinilla* spec: Subprovince of Ifugao, Mt. Polis, *Bur. Sci. 19900 McGregor*, February, 1913, on leaves of *Medinilla compressicaulis.*

GUIGNARDIA Viala et Ravaz

GUIGNARDIA CREBERRIMA Syd. sp. nov.

Maculis amphigenis, magnis, 1–6 cm longis, saepe confluentibus et magnam folii partem occupantibus, griseis vel ochraceo-griseis, linea angusta obscure purpurea cinctis; peritheciis epiphyllis vel amphigenis, numerosis, plerumque per totam maculam dense dispositis, immersis, tandem vertice plus minusve prominulis, globulosis, atris, 120–175 μ diam., membranaceo-coriaceis, contextu opace parenchymatico ex cellulis 6–8 μ diam. composito; ascis fasciculatis, clavatis vel clavato-saccatis, apice rotundatis et leniter incrassatis, breviter stipitatis, 60–90 μ longis, 16–20 μ latis, octosporis; paraphysibus genuinis nullis; sporidiis plerumque fere distichis continuis, ellipsoideo-oblongis, utrinque late rotundatis, hyalinis, saepe grosse 2-guttatis, crasse tunicatis, 15–16.5 μ longis, 8–9 μ latis.

LUZON, vicinity of Manila, *Merrill S 139*, December 22, 1912, on living leaves of *Capparis horrida:* same locality, *Merrill 8544, 8578*, January, February, 1913, on same host.

MYCOSPHAERELLA Johanson

MYCOSPHAERELLA MUSAE Speg.

Maculis orbicularibus vel ellipticis, griseis, 0.5–1.3 cm longis, distinctis; peritheciis sparsis, minutis, atris, 60–75 μ diam., contextu parenchymatico fusco ex cellulis 6–7 μ diam. composito, pertusis; ascis fasciculatis, saccatis, aparaphysatis, 35–48 μ longis, 12–16 μ latis; sporidiis di- tristichis, oblongis, apice

truncato-rotundatis, medio 1-septatis, non constrictis, hyalinis, 2–4-guttulatis, 12–15 μ longis, 3.5–4 μ latis.

LUZON, Province of Laguna, Los Baños, *Baker 21*, September 10, 1912, on dying leaves of *Musa sapientium*.

We are not quite sure that our specimen really is identical with Spegazzini's species, which is unknown to us. We have drawn the above description from the Philippine specimen.

MYCOSPHAERELLA PERICAMPYLI Syd.

LUZON, Province of Bataan, Lamao, *Merrill 8679*, January, 1913: Province of Laguna, Los Baños, *Baker 1065*, May 1, 1913, both specimens on leaves of *Pericampylus incanus*.

DIDYMELLA Saccardo

DIDYMELLA CARICAE Tassi

LUZON, Province of Laguna, Los Baños, *Baker 903*, April 8, 1913, on dead petioles of *Carica Papaya*.

DIDYMOSPHAERIA Fuckel

DIDYMOSPHAERIA STRIATULA Penz. et Sacc.

LUZON, Province of Bataan, Mt. Mariveles, Graff, comm. *Merrill S 156*, November, 1912, on dead bamboo.

HYPOSPILA Fries

HYPOSPILA AMBIGUA Syd. sp. nov.

Peritheciis maculiformiter aggregatis, pseudostromate atro tenui cinctis, globulosis, atris, immersis, circiter 100–140 μ diam., coriaceo-membranaceis, ostiolo minuto papilliformi; ascis clavatis vel saccatis, brevissime stipitatis, indistinte filiformiter paraphysatis, 38–52 μ longis, 11–15 μ latis, octosporis; sporidiis 1–3-stichis, subfusoideis, rectis vel leniter inaequilateris, utrinque obtuse attenuatis, 3-septatis, hyalinis, non constrictis, 15–20 μ longis, 4–5 μ latis.

LUZON, Province of Bataan, Limay, *Bur. Sci. 19067 Graff*, November, 1912, on dead stems of bamboo.

MERRILLIOPELTIS P. Hennings

MERRILLIOPELTIS HOEHNELII Rehm. (Fig. 1.)

Peritheciis solitariis vel saepius plus minus dense maculiformiter dispositis, pseudostromate tenui atro effuso saepe conjunctis, sublenticularibus, 300–650 μ latis, 120–200 μ altis, atris, epidermide atrata nitidula tectis, ostiolo minutissimo vix perspicuo praeditis, contextu opaco; ascis longe clavatis, apice valde incrassatis, basi stipitatis, 220–320 μ longis, 12–16 μ latis, in perithecio fere horizontaliter stipatis; paraphysibus per-

paucis; sporidiis distichis, fusiformibus, saepe leniter inaequilateris, medio 1-septatis non constrictis, hyalinis, utrinque longe et acutissime attenuatis et quasi aristatis, 50–75 μ longis, 7.5–10 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8664*, March, 1913, on dead *Arenga saccharifera*.

We have made the above description from our material. The perithecia are often provided with a very thin pseudostroma which combines some of them. The position of the asci is very peculiar. As the perithecia are much flattened and measure only up to 200 μ in height, and the asci are up to 320 μ long, the latter cannot stand upright, but are placed parallel to the surface of the substratum. In the perithecium on the left side of our figure the point of attachment is nearly in the middle, while that on the right shows a distinctly lateral attachment of the asci.

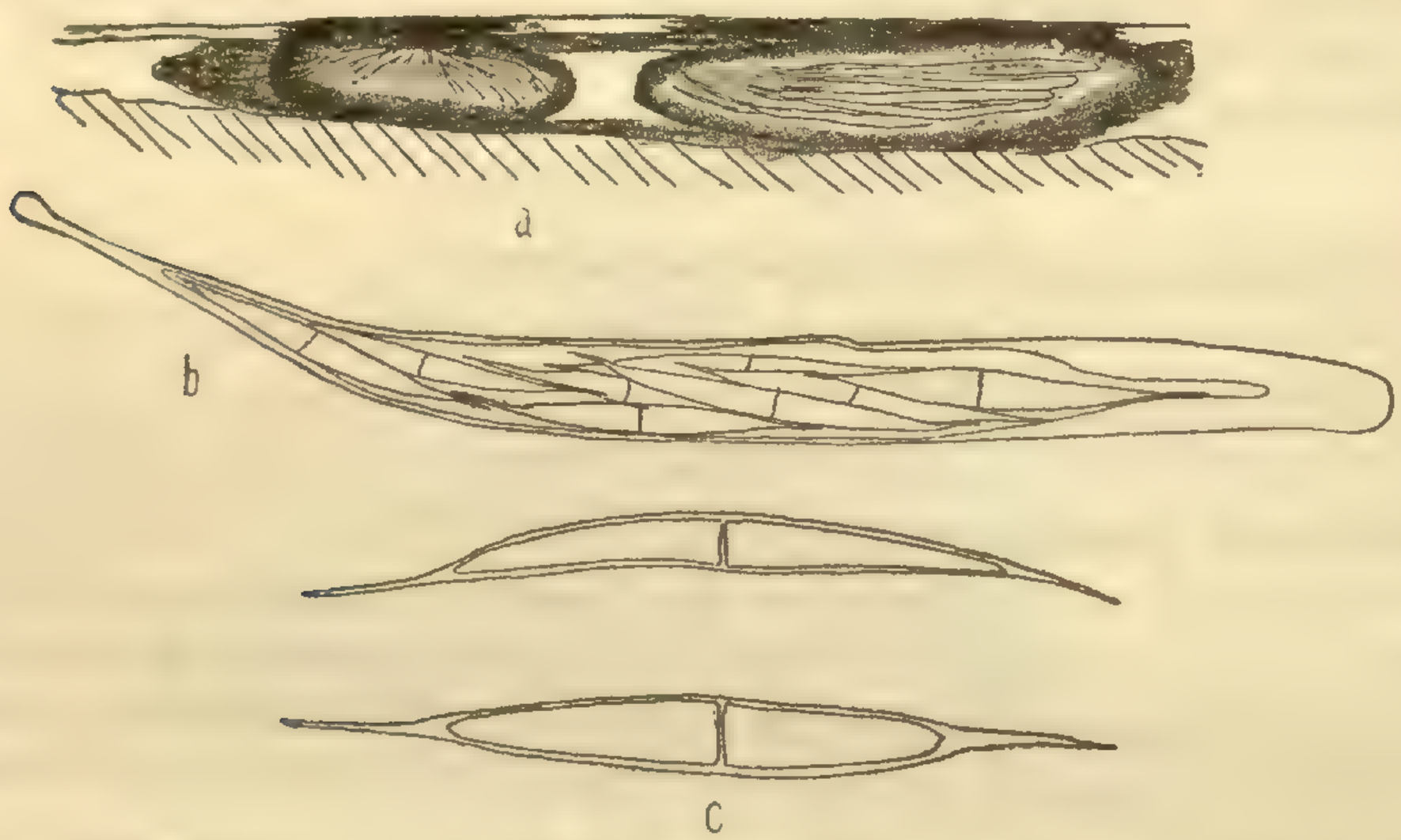

FIG. 1. *Merrilliopeltis Hoehnelii* Rehm. *a*, Section through two perithecia (×75); *b*, ascus (×340); *c*, two sporidia (×620).

MERRILLIOPELTIS DAEMONOROPIS Syd. sp. nov.

Peritheciis in maculis 1–3 cm longis densiuscule dispositis, pseudostromate spurio effuso saepe conjunctis, lenticularibus, 200–400 μ latis epidermide lenissime elevata sed vix atrata tectis, ostiolo vix perspicuo praeditis, contextu opaco parenchymatico ex cellulis 8–10 μ diam. composito; ascis longe clavatis; paraphysibus nullis vel perpaucis; sporidiis 2–4-stichis, inaequilateris, medio 1-septatis non constrictis, ad apices acutissimis, hyalinis, 100–120 μ longis, 8–10 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8428*, November, 1912, on dead *Daemonorops Gaudichaudii*.

Although the material at hand is already somewhat old we are certain that the fungus belongs to *Merrilliopeltis*. The sporidia at both ends taper to a long very acute point. The asci must be very long, but we cannot give their measurements, as we have not seen entire asci.

ANTHOSTOMELLA Saccardo

ANTHOSTOMELLA DISCOPHORA Syd. sp. nov.

Peritheciis sparsis vel binis trinis consociatis, planis, lenticularibus, ambitu rotundatis, 0.5–1 mm diam., centro immersis, atris, opacis, areola plana marginata circulari minuta sed semper bene distincta medio obtuse papillata praeditis; ascis jam resorptis; sporidiis ellipsoideis, continuis, utrinque obtusulis, fuscis, 11–15 μ longis, 5–7 μ latis.

LUZON, Province of Bataan, *Bur. Sci. 19009 19010 Graff*, November, 1912, on dead stems of bamboo.

ROSELLINIA de Notaris

ROSELLINIA MEGALOSPERMA Syd. sp. nov.

Peritheciis solitariis vel paucis aut compluribus aggregatis, subiculo omnino destitutis, superficialibus vel basi applanata paullo immersis, semiglobosis vel parum elongatis, glabris, levibus, atris, ostiolo minuto papilliformi nitenti praeditis, carbonaceis, ca. 1 mm altis, 0.7–0.9 mm latis; ascis clavatis, apice rotundatis, 150–180 μ longis, 20–28 μ latis, paraphysatis; sporidiis distichis vel raro subtristichis, oblongis, utrinque lenissime attenuatis, sed apicibus plerumque obtusis, continuis, fuligineo-fuscis, 45–88 μ longis, 12–16 μ latis.

LUZON, Manila and vicinity, *Merrill 8510*, January, 1913, on dead twigs of *Streblus asper*.

ROSELLINIA MERRILLII Syd. sp. nov.

Peritheciis gregariis vel dense confertis, plagulas longe lateque effusas formantibus, e subiculo adnato tomentoso denso atrofusco ex hyphis fuscis septatis 3–3.5 μ crassis composito persistenti emergentibus, globosis, firmis, 1 mm diam., glabris, in parte inferiore minute rugolosis, superiore parte levibus, opace atris, distincte papillatis; ascis teretibus, 170–230 μ longis, 12–14 μ latis, octosporis; sporidiis monostichis, ellipsoideo-fusoideis, utrinque subobtusis, continuis, obscure brunneis, 25–30 μ longis, 9–11 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8660*, March, 1913, on thick decorticated twigs.

The species is nearly related to *Rosellinia aquila* (Fr.) de Not., but differs in the larger sporidia.

ROSELLINIA CALAMI P. Henn.

LUZON, Manila and vicinity, *Merrill 8383, 8481*, September, November, 1912, on dead bamboo.

HYPOXYLON Bulliard

HYPOXYLON MARGINATUM (Schw.) Berk.

LUZON, Province of Bataan, *Bur. Sci. 19055 Graff*, November, 1912, on dead twigs.

HYPOXYLON RUBIGINOSUM (Pers.) Fr.

LUZON, Province of Bataan, Mt. Mariveles, *Bur. Sci. 19063, 19081 Graff*, November, 1912, on dead log.

NUMMULARIA Tulasne

NUMMULARIA ANTHRACODES (Fr.) Mont.

LUZON, Province of Bataan, Mt. Mariveles, *Bur. Sci. 19026 Graff*, November, 1912, on dead bark.

ASTROCYSTIS Berkeley et Broome

ASTROCYSTIS MIRABILIS Berk. et Br.

LUZON, Province of Rizal, Antipolo, *Bur. Sci. 16830* (in part) *Ramos*, October, 1912, on dead *Bambusa* spec. in society with *Trichosporium olivatrum* Sacc.: Province of Bataan, *Bur. Sci. 19007 Graff* November, 1912, on bamboo.

Rosellinia Bambusae P. Henn., described in Hedwigia **47** (1908) 256, and based on material from Mt. Arayat, Province of Pampanga, Luzon (*Merrill 5030*) is the same as *Astrocystis mirabilis*.

ASTROSPHAERIELLA Sydow

ASTROSPHAERIELLA FUSISPORA Syd.

LUZON, Manila and vicinity, *Merrill 8383*, in part, September, 1912, on dead bamboo, in society with *Rosellinia Calami* P. Henn.

It is interesting to note the occurrence of this species in the Philippines, as it has been recently described from Japan (Annal. Myc. 11 (1913) 261).

APIOSPORELLA von Hoehnel

APIOSPORELLA ABERRANS Syd. sp. nov.

Peritheciis plus minus aequaliter dispersis, solitarie in stromate effuso atro parce evoluto insidentibus, globosis, atris, subcarbonaceis, vertice per epidermidem fissam erumpentibus, 150–190 μ diam., distincte papillatis, pariete crasso, inferne vix evoluto, contextu opaco, nucleo albo; ascis clavatis, apice rotundatis, breviter stipitatis, 52–75 μ longis, 16–19 μ latis, octosporis, filiformiter paraphysatis, sporidiis distichis, ellipsoideis vel oblongis, utrinque obtusis, diu continuis, tandem prope basim distincte 1-septatis, hyalinis, 16–26 μ longis, 6.5–11.5 μ latis, cellula inferiore 3–4 μ tantum longa.

LUZON, Manila and vicinity, *Merrill 8475*, November, 1912. *Bur. Sci. 19135, 20645 Graff*, December, 1912, and January, 1913, all on dead bamboo; *Merrill 8470*, November, 1912, on dead *Bambusa Blumeana*.

The fungus is not a typical member of the genus *Apiosporella*, as the perithecia, although solitary, are usually situated with their bases upon a more or less effused black stroma and the lowest portion of the perithecial wall is hardly developed. It cannot be placed among the *Dothideaceae*, as the perithecia have distinct papillæ. The sporidia are very long, unicellular, and only at perfect maturity are they 1-septate near the base.

DIATRYPELLA Cesati et de Notaris

DIATRYPELLA PSIDII Syd. sp. nov.

Stromatibus sparsis vel laxe aggregatis, tuberculari-erumpentibus, 0.8–1.8 mm diam., rotundatis, atris, cortice fisso arcte cinctis, opacis, rugulosis; peritheciis 5–12 in singulo stromate congestis globosis vel lateraliter compressis, 300–450 μ diam., ostiolo papilliformi conico brevi vel saepe etiam plus minus elongato donatis; ascis clavatis, apice late rotundatis, p. sp. 50–60 μ longis, 10–16 μ latis, polysporis; sporidiis allantoideis, hyalinis vel subhyalinis, in cumulo flavo-brunneolis, rectis vel leniter curvatis, 5–6.5 μ longis, 1–1.5 μ latis.

LUZON, Bontoc Subprovince, *Vanoverbergh 2510*, January, 1913, on twigs of *Psidium guajava*.

MICROPELTELLA Sydow

MICROPELTELLA MEGASPERMA Syd. sp. nov.

Peritheciis epiphyllis, sparsis, superficialibus, atris, opacis, orbicularibus, 500–900 μ diam., alato-scutatis, marginem versus pellucide coeruleis ibique ex hyphis ca. 1.5 μ latis maeandrice curvatis dense intertextis compositis, praeterea zona tenuissima membranacea hyalina plus minus lata (40–60 μ) saepe latissima (usque 160 μ) ex hyphis tenuissimis ca. 1 μ latis composita cinctis, ostiolo rotundato 20–25 μ lato distincto; ascis sessilibus, fusiformi-clavatis vel cylindraceo-clavatis, crasse tunicatis, 150–200 μ longis, 26–35 μ latis, aparaphysatis, 2–8-sporis; sporidiis distichis, oblongo-fusoideis, 2-septatis, raro 3-septatis (septis crassis), hyalinis, 65–75 μ longis, 10–16 μ latis, cellulis subaequilongis, cellula superiore latiore, intus minute granulosis.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 20482 Ramos*, February, 1913, on living leaves of *Eugenia* spec.

The perithecia have a more or less broad hyaline margin which is sometimes up to 180 μ wide. The asci contain either 8 spores or only 6, 4, or 2 spores. The latter are very variable in size. In younger asci they measure only about 30–40 μ in length and 10–16 μ in breadth, but, when in full maturity, they attain 75 μ in length and 35 μ in breadth. The species certainly comes very near to *Micropeltis bogoriensis* v. Hoehn. Fragmente zur Mykologie XIV, p. 8.

MICROPELTIS Montagne

MICROPELTIS SEMECARPI Syd. sp. nov.

Peritheciis epiphyllis, sine maculis, in greges 1–4 cm latos aequaliter densiusculeque dispositis, dimidiatis, centro elevatis, minute papillulatis et pertusis, orbicularibus, 200–240 μ diam., atris, glabris, contextu ex hyphis tenuibus olivaceo-brunneis flexuosis vel etiam ramosis non vel vix septatis 1–1.5 μ latis subradiatim composito, margine plus minus lato albo-membranaceo tenuissimo cinctis; ascis cylindraceo-clavatis, apice obtusis, 45–55 μ longis, 8–11 μ latis, octosporis; paraphysibus copiosis simplicibus, filiformibus, 50–60 μ longis, 0.75 μ latis; sporidiis oblique monostichis usque distichis, fusoideis, primo 1-septatis, dein 2-septatis, constrictis, hyalinis, utrinque obtusis, 15–18 μ longis, 3–5 μ latis.

LUZON, Manila and vicinity, *Merrill 8568*, January, 1913, on leaves of *Semecarpus cuneiformis*.

Rehm (supra 190) mentions a *Micropeltis* on the same host, collected by Baker at Los Baños. Our form, however, is a quite different species.

SEYNESIA Saccardo

SEYNESIA IPOMOEAE Syd. sp. nov.

Mycelio nullo; peritheciis epiphyllis, in maculas 0.5–1.5 cm latas orbiculares dense dispositis, atris, applanatis, pusillis, 55–100 μ diam., stellatim dehiscentibus et aetate plus minus late apertis, contextu radiato atro opaco ex hyphis crassiusculis composito; ascis ovato-globosis, 30–35 μ longis, 24–28 μ latis, aparaphysatis, octosporis; sporidiis conglobatis, ellipsoideo-oblongis, medio 1-septatis et leniter constrictis, utrinque rotundatis, ex hyalino flavo-brunneolis, tandem fuscis, levibus, 15–17 μ longis, 7.5–8.5 μ latis, cellula superiore saepe latiore.

LUZON, Manila and vicinity, *Merrill 8591*, February, 1913, on living leaves of *Ipomoea obscura*.

ASTERINA Léveillé

ASTERINA PUSILLA Syd. sp. nov.

Epiphylla, maculas parum conspicuas minutas vel confluendo majores et effusas formas; mycelio ex hyphis longiusculis dilute fuscis vix vel parce septatis parum ramosis 3.5–4.5 μ crassis composito; hyphopodiis continuis, alternantibus, fere semper 2–3-lobatis (lobis obtusis), usque 10 μ longis, saepe latioribus quam altioribus, peritheciis laxe gregariis, minutissimis, 70–80 μ diam., tenuissimis, radiatim strato simplici contextis, e centro ad marginem versus stellatim dehiscentibus, contextu ex hyphis 2–3 μ

latis regulariter composito 17–20 μ latis, octosporis, aparaphysatis; sporidiis 1-septatis et valde constrictis, levibus, fuscis, 16–20 μ longis, 7–8 μ latis.

LUZON, Province of Bataan, *Bur. Sci. 19061 Graff*, November, 1912, on living leaves of *Premna nauseosa* (type); same locality, *Bur. Sci. 19016 Graff*, on leaves of another *Premna*.

ASTERINA ESCHAROIDES Syd.

Epiphylla, maculas minutas 1–4 mm latas atras efficiens, mycelio parco, ex hyphis anastomosantibus remote septatis fuscis levibus 3.5–5.5 μ crassis composito; hyphopodiis paucis, irregularibus, bicellularibus, cellula basali plerumque breviter cylindracea, superiore multo latiore parum lobata et 8–10 μ lata, totis 12–18 μ longis; perithecciis aggregatis, rotundatis, 130–170 μ diam., stellatim dehiscentibus, contextu ex hyphis rectis fuscis 2.5–3 μ latis radiatim composito; ascis globosis vel subglobosis, aparaphysatis, 26–40 μ longis, 24–32 μ latis, octosporis; sporidiis oblongis, utrinque rotundatis, medio 1-septatis et leniter constrictis, primitus hyalinis, dein brunneis, in maturitate minute verruculosis, 17–22 μ longis, 8–12 μ latis.

LUZON, Manila and vicinity, *Merrill 8601*, February, 1913, on living leaves of *Quisqualis indica*.

The above diagnosis of *Asterina escharoides* Syd., first described in Elmer's Leafl. Philip. Bot. 4 (1911) 1155, has been made from the Manila material.

ASTERINA CAPPARIDIS Syd. et Butl.

LUZON, Manila and vicinity, *Merrill 8598*, February 10, 1913, on leaves of *Capparis horrida*.

ASTERINA ELAEOCARPI Syd.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8669*, March, 1913, on leaves of *Elaeocarpus argenteus*.

ASTERINA PEMPHIDIOIDES Cke.

LUZON, Province of Bataan, *Bur. Sci. 19075 Graff*, November, 1912, on leaves of *Eugenia*, perhaps *E. similis*.

ASTERINA SPONIAE Rac.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8657*, March, 1913. PANAY, Province of Iloilo, *Bur. Sci. 18251 Robinson*, January 1–11, 1913, both specimens on leaves of *Trema amboinensis*.

ASTERINA ELMERI Syd.

LUZON, Manila and vicinity, *Merrill 8536*, January, 1913: Province of Bataan, *Merrill 8699*, January, 1913, *Bur. Sci. 19060 Graff*, November, 1912, all specimens on leaves of *Champeria manillana*.

ASTERINA CASSIAE Syd.[1]

LUZON, Province of Bataan, Lamao, *Merrill 8687*, January, 1913: Province of Bataan, *Bur. Sci. 19012 Graff*, November, 1912, both specimens on leaves of *Glochidion llanosii*.

ASTERINELLA Theissen

ASTERINELLA OBESA Syd. sp. nov.

Epiphylla, maculas atras laxas rotundatas 2–8 mm diam. efformans; mycelio laxo, ex hyphis longis parce ramosis et remote septatis obscure brunneis crassis 6–10 μ latis composito; hyphopodiis nullis; peritheciis laxe aggregatis, fere semper elongatis et 250–400 μ longis, 125–200 μ latis, rarius rotundatis, centro elevatis, rima longitudinali apertis aterrimis, amoene radiatim contextis, contextu opace olivaceo-atro ex hyphis 3.5–4.5 μ latis obscure olivaceo-brunneis fimbriatis; ascis globosis, subglobosis vel ovatis, aparaphysatis, 50–60 μ longis, 40–52 μ latis; sporidiis conglobatis, ellipsoideis vel ellipsoideo-oblongis, ex hyalino obscure olivaceo-brunneis, levibus, 32–38 μ longis, 16–20 μ latis, cellula superiore maxima, inferiore minima 7–10 μ tantum longa et omnino appendiculiformi saepe dilutiore.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20265 McGregor*, January, 1913, on leaves of *Canarium villosum*.

This is in some respects a very interesting member of the genus *Asterinella*, as the hyphae both of the mycelium and of the perithecial tissue are, by comparison, very thin, and the sporidia are very unequally septate, the lower cell being only an appendix of the upper larger one.

ASTERINELLA LORANTHI Syd. sp. nov.

Hypophylla, maculas atras irregulares plus minus longas efformans, saepe totam folii superficiem occupans; mycelio parcissimo, ex hyphis anastomosantibus parcissime septatis flavo-brunneis usque brunneis 4–6 μ latis composito; hyphopodiis nullis; peritheciis laxe aggregatis, rotundatis, 140–180 μ diam., subcarbonaceis, stellatim dehiscentibus et mox late apertis, atris, contextu radiato olivaceo-fusco ex hyphis breviter articulatis (articulis 6–8 μ longis, 2.5–4 μ latis) strato simplici composito, ascis globosis usque ovatis, 45–60 μ longis, 32–45 μ latis, octosporis; sporidiis ellipsoideo-oblongis utrinque late rotundatis, medio 1-septatis et valde constrictis (loculis facile seceden-

[1] Reëxamination of the type material of *Asterina cassiae* Syd. shows that the host is *Glochidion llanosii* and not *Cassia timoriensis*. The correction as to the host should be made on the label of Sydow's Fungi exotici exsiccati No. 135. E. D. M.

tibus) mox fusco-atris, tota superficie verrucosis, 26–34 μ longis, 14–16 μ latis; pycnidiosporis simul praesentibus continuis, subglobosis vel ovatis, fuscis, 18–22 μ longis, 13–15 μ latis.

LEYTE, Dagami, Bur. Sci. *15243a Ramos*, August, 1912, on living leaves of *Loranthus leytensis*.

The mature sporidia are very dark, nearly black. We have seen 8-spored asci, but some of them seen to have only 4 or 6 spores.

ASTERINELLA LUZONENSIS Syd. sp. nov.

Mycelio hypophyllo, plerumque parcissimo, vix visibili, ex hyphis longiusculis flexuosis anastomosantibus fusco-brunneis 3.5–5 μ latis septatis (articulis 16–22 μ longis) levibus composito; hyphopodiis nullis; peritheciis plerumque in greges 0.5–1 cm latos laxissime dispositis, inversis, variabilibus, aut ambitu rotundatis, aut irregularibus usque valde elongatis, 150–200 μ diam. vel usque 800 μ longis et 170 μ latis, strato simplici ex hyphis rectis fusco-brunneis 3.5–4 μ latis contextis, poro centrali vel rima longitudinali dehiscentibus; ascis globosis vel subglobosis, 50–62 μ longis, 40–52 μ latis, octosporis, aparaphysatis; sporidiis oblongis, utrinque rotundatis, medio 1-septatis, vix vel leniter constrictis, levibus, tandem brunneis, 29–33 μ longis, 13–15 μ latis.

LUZON, Province of Bataan, *Bur. Sci. 19033 Graff*, November, 1912, on leaves of *Shorea polysperma*.

The new species is related to *Asterinella Humiriae* (P. Henn.) Theiss., but differs chiefly by the larger, often elongated, perithecia.

ASTERINELLA LUGUBRIS Syd. sp. nov.

Mycelio epiphyllo, tenui, plus minus effuso, parce maculiformi, ex hyphis laxe intertextis 3–5 μ crassis fuscis longiusculis ramosis non vel parce septatis composito; hyphopodiis nullis; peritheciis sparsis, variabilibus, aut rotundatis et 100–140 μ diam., aut valde elongatis et usque 600 μ longis, 70–120 μ latis, subinde etiam triangularibus, ambitu hyphis radiantibus cinctis, stellatim vel rima longitudinali dehiscentibus, pluristratosis, contextu atro opaco; ascis ovatis vel oblongis, sessilibus, 35–50 μ longis, 24–26 μ latis, octosporis; paraphysibus numerosis, distinctis, ramosis, hyalinis, ad apicem lenissime incrassatis, sporidiis oblongis, utrinque rotundatis, medio 1-septatis et valde constrictis, levibus, tandem fuscis, 18–24 μ longis, 8–9 μ latis.

LUZON, Manila and vicinity, *Merrill 8557*, January, 1913, on leaves of *Ixora philippinensis*.

ASTERINELLA DISTINGUENDA Syd. sp. nov.

Mycelio amphigeno, tenui, plus minus effuso, parce maculiformi, ex hyphis laxe intertextis 3–5 μ crassis fuscis longiusculis ramosis anastomosantibus parce septatis composito; hyphopodiis nullis; peritheciis aggregatis, irregularibus, plerumque ellipticis vel oblongis, rarius rotundatis, 150–225 μ longis, 100–170 μ latis, ambitu hyphis radiantibus cinctis, stellatim vel rima longitudinali dehiscentibus, tendem plus minus late apertis, pluristratosis, contextu atro opaco; ascis globosis usque ovatis, sessilibus, 20–35 μ longis, 15–19 μ latis, octosporis, aparaphysatis; sporidiis conglobatis, ovato-oblongis, medio 1-septatis et leniter constrictis, ex hyalino olivaceo-fuscis, levibus, 12–14 μ longis, 5.5–6.5 μ latis, loculo superiore plerumque latiore, pycnidiis simul praesentibus peritheciis simillimis; pycnidiosporis subrectis usque falcatis, continuis, hyalinis, 15–18 μ longis, 1–1.5 μ latis; basidiis brevissimis 4–6 μ longis.

LUZON, Manila and vicinity, *Merrill 8511*, January, 1913, on leaves of ***Ixora philippinensis.***

In external appearance this species agrees entirely with *Asterinella lugubris* Syd. from the same host. It differs, however, by the smaller perithecia which are usually not much elongated, by the smaller asci and sporidia, and in the absence of paraphyses. The pycnidiospores mentioned in our description seem to belong to the *Asterinella*, as they are formed in pycnidia quite similar to the perithecia of the ascigerous stage.

TRICHOTHYRIUM Spegazzini

TRICHOTHYRIUM ORBICULARE Syd. sp. nov. (Fig. 2.)

Hypophyllum, in mycelio Meliolae parasiticum, mycelio hyphas Meliolae omnino amplectente et pelliculam tenuem fere continuam efformante, ex hyphis obscure olivaceo-fuscis ramosis et anastomosantibus vix vel parce septatis, 2–3 μ latis (permultis tenuioribus et pallidioribus subhyalinis interjectis) composito; hyphopodiis nullis; peritheciis radiatim oriundis, dense stipatis, ambitu omnino orbicularibus, 125–150 μ diam., atris, dimidiato-scutatis, centro ostiolo rotundo 15–25 μ lato distincto praeditis, contextu obscure fusco saepe subopaco, centro dilutiore, amoene radiatim ex hyphis 2.5–3 μ latis fuscis composito; ascis ovato-oblongis vel oblongis, sessilibus, apice rotundatis, non vel leniter incrassatis, octosporis, non paraphysatis, 35–50 μ longis, 15–18 μ latis; sporidiis distichis, subinde tristichis, ovato-oblongis, medio 1-septatis, non vel leniter constrictis, hyalinis, 14–17 μ longis, 3–4.5 μ latis, cellula superiore latiore.

LUZON, Subprovince Ifugao, Mt. Polis, *Bur.-Sci. 19903 McGregor*, February, 1913, living on the mycelium of a *Meliola* on leaves of *Helicia* sp.

The sporidia are hyaline and the subiculum is not composed of isolated hyphae but forms a continuous thin pellicle in which thick brown hyphae are to be seen. The space between these brown hyphae is entirely filled by much thinner and nearly colorless hyphae. The material at hand seems to be slightly immature. Perhaps the sporidia in full maturity become more than two-celled.

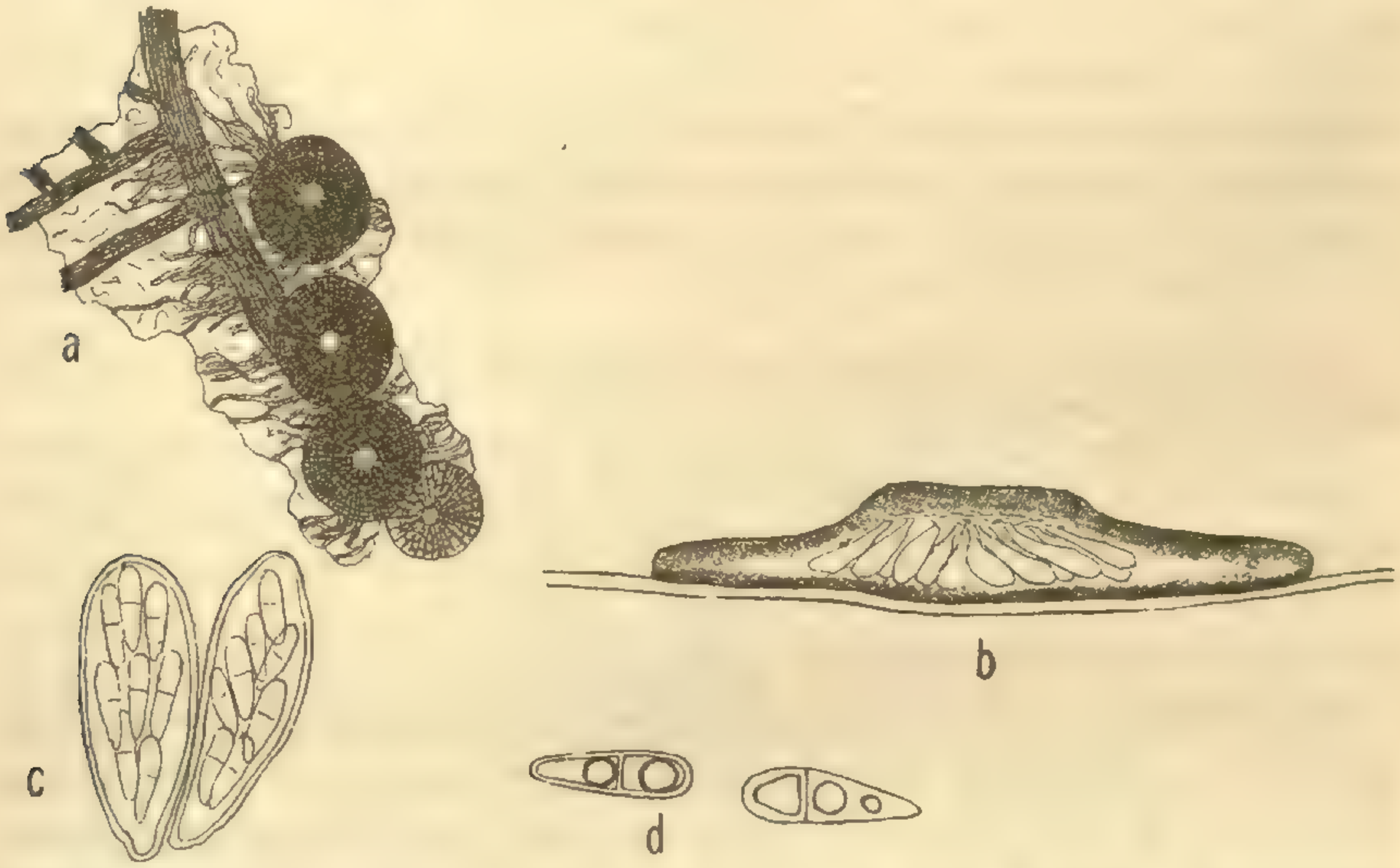

FIG. 2. *Trichothyrium orbiculare* Syd. *a*, Subiculum and perithecia (×60); *b*, longitudinal section through a perithecium (×190); *c*, two asci (×400); *d*, two sporidia (×600).

GIBBERELLA Saccardo

GIBBERELLA CREBERRIMA Syd. sp. nov.

Peritheciis gregariis, saepe seriatim dispositis, superficialibus, caulem longe lateque obtegentibus, caespitoso-confluentibus et concrescentibus, coriaceo-submembranaceis, leniter verrucosis, ovoideis, demum apice cupuliformiter collapsis, basi contracta saepe subpedicellatis, atris, 150–275 μ altis, 120–200 μ latis, papillatis, contextu parenchymatico pallide violaceo ex cellulis 8–12 μ diam. composito; ascis clavatis, sessilibus, 70–100 μ longis, 12–20 μ latis, octosporis, indistincte paraphysatis; sporidiis oblique monostichis vel saepius distichis, ellipsoideo-oblongis, utrinque rotundatis, 3-septatis, ad septa non constrictis, hyalinis, guttulatis, 18–22 μ longis, 7–9 μ latis.

LUZON, Province of Laguna, Los Baños, *Baker 1029*, April 20, 1913, on living stems of *Scleria* spec.

HYPOCRELLA Saccardo

HYPOCRELLA MELAENA Syd. sp. nov.

Stromatibus hypophyllis, ad nervos foliis evolutis, solitariis vel saepius aggregatis et confluentibus, magnis, rotundatis, pulvinatis, 2–8 mm longis vel latis, confluendo subinde etiam majoribus, lata basi sessilibus, quoad crassitudinen variabilibus, sive planis, sive medio plus minus convexis, levibus, glabris, aterrimis, opacis, intus albido-lignosis; perithecciis monostichis, omnino immersis, globoso-conicis, 150–225 μ diam., in quoque stromate numerosissimis; ascis cylindraceis vel clavato-cylindraceis, apice rotundatis, deorsum pedicellatis, 120–145 μ longis, 8–14 μ latis; sporidiis mox jam in asco in segmenta secedentibus, articulis 6–9 μ longis, 1–1.5 μ latis, hyalinis.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 20614 Ramos*, February, 1913, on leaves of *Dillenia philippinensis*.

This is a very conspicuous species, easily recognized by the large, often confluent, black stromata which are nearly always developed on the veins of leaves.

PHYLLACHORA Nitschke

PHYLLACHORA PHASEOLINA Syd. sp. nov.

Stromatibus epiphyllis, sparsis, leniter convexis, in hypophyllo non vel parum conspicuis, irregularibus, minutis, 0.4–1 mm diam., atris, opacis, intus paucilocularibus; ascis cylindraceis vel clavatis, 40–50 μ longis, 10–14 μ latis, octosporis; sporidiis subglobosis vel late ellipsoideis, continuis, hyalinis, 8–10 μ longis, 5–7 μ latis.

LUZON, Province of Laguna, Los Baños, *Baker 1064*, May 1, 1913, on living leaves of *Phaseolus calcaratus*.

PHYLLACHORA ROTTBOELLIAE Syd. et Butl.

Stromatibus plerumque in utraque foliorum pagina conspicuis, elongatis, 0.3–1.5 cm longis 1–2 mm latis, innatis, atris, opacis, glabris, loculis numerosis praeditis; ascis clavatis, 80–110 μ longis, 18–20 μ latis, octosporis, paraphysatis; sporidiis monostichis vel oblique monostichis, ellipsoideis, utrinque obtusis vel leniter attenuatis, continuis, hyalinis, 15–20 μ longis, 8–11 μ latis.

LUZON, Bontoc Subprovince, *Vanoverbergh 2520*, January, 1913, on leaves of *Rottboellia exaltata*.

As will be seen from the above description the stromata, asci, and sporidia are larger than given in the original diagnosis in Annal. Mycol. 9: 400, owing to the fact that the Philippine material is better developed.

PHYLLACHORA CANARII P. Henn.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20269 McGregor*, January, 1913, on leaves of *Canarium villosum*.

PHYLLACHORA ROUREAE Syd.

LUZON, Province of Bataan, Mt. Mariveles, *Bur. Sci. 19024 Graff*, November, 1912, on leaves of *Rourea erecta.*

PHYLLACHORA MINUTA P. Henn.

LUZON, Bontoc Subprovince, *Vanoverbergh 2518*, January, 1913, on leaves of *Hibiscus tiliaceus.*

PHYLLACHORA CYNODONTIS (Sacc.) Niessl.

LUZON, Vicinity of Manila, *Merrill S 147*, January 25, 1913, on leaves of *Cynodon Dactylon.*

AUERSWALDIA Saccardo

AUERSWALDIA MERRILLII P. Henn.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8607*, March, 1913, on leaves of *Freycinetia* sp.

DISCODOTHIS von Hoehnel

DISCODOTHIS LOBATA Syd. sp. nov. (Fig. 3).

Stromatibus hypophyllis, solitariis vel saepius binis usque quaternis caespitosis, superficialibus, sed matrici arcte adhaerentibus, valde irregularibus, rotundatis, oblongis vel varie curvatis aut lobatis, 1–2 mm longis, 0.8–1.3 mm latis, crassis, aterrimis, opacis, subcarbonaceis, primitus hyphis simplicibus fuscis usque 100 μ longis 4 μ crassis saepe lenissime torulosis dense obsessis, tandem glabris; loculis paucis, majusculis et planis, mox omnino confluentibus et hymenium continuum planum tandem liberum formantibus, ostiolis nullis, contextu ad marginem ex cellulis elongatis, in medio parenchymatico ex cellulis isodiametricis rotundatis vel angulatis composito, ascis clavatis, sessilibus, ad apicem rotundatis et saepe incrassatis, 60–80 μ longis, 15–18 μ latis, octosporis; paraphysibus perpaucis ramosis, tenuibus, hyalinis, superne cum particulis brunneis irregularibus stratum tenue vel quasi epithecium fuscum formantibus; sporidiis distichis, ovato-oblongis vel ellipsoideo-oblongis, utrinque obtusis, medio 1-septatis, non constrictis, ex hyalino dilute brunneis, 17–20 μ longis, 6.5–8 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8631*, March, 1913, on living or dying leaves of *Cyathea caudata.*

Up to the present time, only one member of the interesting genus *Discodothis* had been known, *D. Filicum* v. Hoehn. growing on fern-leaves in Java. The new species differs in many respects from the type species, as, for example, the stromata are somewhat larger, but extremely variable in shape, being often lobate, and thicker, the asci are more or less thickened and the sporidia are larger. The material at hand shows the ascus-stage of the new species in plentiful development. The bases of the ascomata

are composed of small, yellow-brown, indistinct, and thick-walled cells, the margins of long, nearly fibrous, black-brown cells with very thick walls. The tissue in the midst of the ascomata is formed of rounded, angular or isodiametric, parenchymatous cells which also have very thick walls. The hymenial layer is interspersed with small and irregular brown particles. The same particles together with the ends of the poorly developed paraphyses form a brown layer over the asci. The few, large and flat loculi soon run entirely together, forming one large and continuous hymenium.

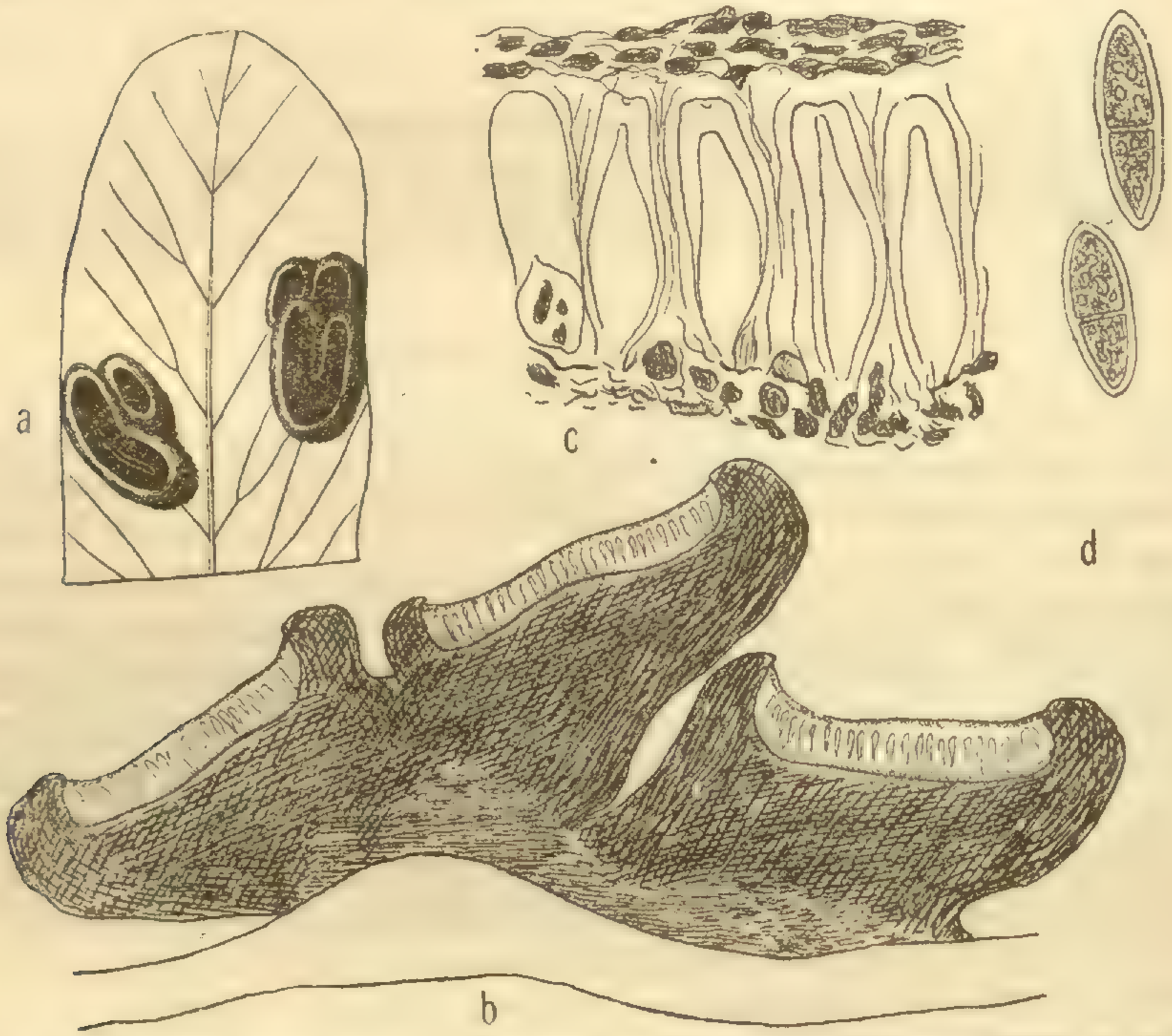

FIG. 3. *Discodothis lobata* Syd. *a*, A fragment of the leaf with 4 stromata (×10); *b*, longitudinal section through a group of stromata (×70); *c*, longitudinal section through the hymenium (×400); *d*, two sporidia (×700).

SCIRRHIA Nitschke

SCIRRHIA LUZONENSIS P. Henn.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8628*, March, 1913, on leaves of *Schizotachyum* spec.

SCIRRHIA SERIATA Syd. et Butl.

LUZON, Province of Laguna, Mt. Maquiling *Brown S 168*, March, 1913; Los Baños, *Foxworthy S 160*, January, 1913, both on leaves of *Gigantochloa Scribneriana*.

GLONIUM Mühlenberg

GLONIUM BAMBUSINUM Syd. sp. nov.

Peritheciis sparsis vel seriatim dispositis, sessilibus, oblongis, 0.5–1 mm longis, 0.25 mm circiter latis, rima tenuissima percursis, atris, subcarbonaceis; ascis anguste clavatis, apice obtusis,

44–52 μ longis, 8–9 μ latis, octosporis; paraphysibus filiformibus, hyalinis, tenuibus, 1 μ latis; sporidiis oblique monostichis usque distichis, ellipsoides vel oblongis, medio 1-septatis, leniter constrictis; hyalinis, 6–9 μ longis, 3–4 μ latis.

LUZON, Province of Bataan; *Bur. Sci. 19005 Graff*, November, 1912, on dead stems of bamboo.

LOPHODERMIUM Chevallier

LOPHODERMIUM ARUNDINACEUM (Schrad.) Chev.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8665*, March, 1913, on *Miscanthus sinensis*.

PARMULARIA Léveillé

PARMULARIA HYMENOLEPIDIS P. Henn.

LUZON, Subprovince of Ifugao, Mt. Polis, *Bur. Sci. 19898 McGregor*, February, 1913, on leaves of *Polypodium varians*.

TRIBLIDIELLA Saccardo

TRYBLIDIELLA RUFULA (Spreng.) Sacc.

LUZON, Province of Bataan, *Bur. Sci. 19092 Graff*, November, 1912, on dead twigs: Manila and vicinity, *Merrill 8462*, November, December, 1912, on dead twigs of *Prosopis Vidaliana*.

BULGARIASTRUM Sydow gen. nov. Bulgariacearum

(Etym. a *Bulgaria*)

Ascomata phyllogena, minuta, caespitosa, erumpenti-superficialia, subturbinata, subsessilia vel stipite brevissimo centrali crassiusculo praedita, gelatinosa, atra, in sicco cornea, parenchymatice contexta. Asci clavati vel cylindraceo-clavati, octospori. Paraphyses filiformes, epithecium formantes. Sporidia didyma, oblonga, hyalina.

BULGARIASTRUM CAESPITOSUM Syd. sp. nov. (Fig. 4).

Ascomatibus semper hypophyllis, in epiphyllo maculas minutas leniter depressas efformantibus, dense caespitosis et greges orbiculares 1–2.5 mm latos formantibus, erumpenti-superficialibus, subsessilibus vel basi brevissime stipitiformiter contractis, subturbinatis, glabris, gelatinosis, in sicco corneis, atris, disco leniter concavo, contextu parenchymatico ex cellulis majusculis 12–17 μ diam. composito; ascis tereti-clavatis, apice rotundatis, 60–90 μ longis, 14–16 μ latis, octosporis; paraphysibus filiformibus, sursum epithecium densum flavo-fuscidulum formantibus; sporidiis oblique monostichis usque distichis, oblongis vel ovato-oblongis, medio 1-septatis et vix vel leniter constrictis, hyalinis, minutissime guttulatis, 14–16 μ longis, 6–7 μ latis, cellula superiore plerumque late rotundata et paullo crassiore. Status pycnidicus (excipulinae speciem sistens) simul adest habitu ascomatum

cum sporulis fusiformibus, plerumque curvatis, diu continuis, dein 1-septatis et tandem spurie 3-septatis, 26–45 μ longis, 3.5–4.5

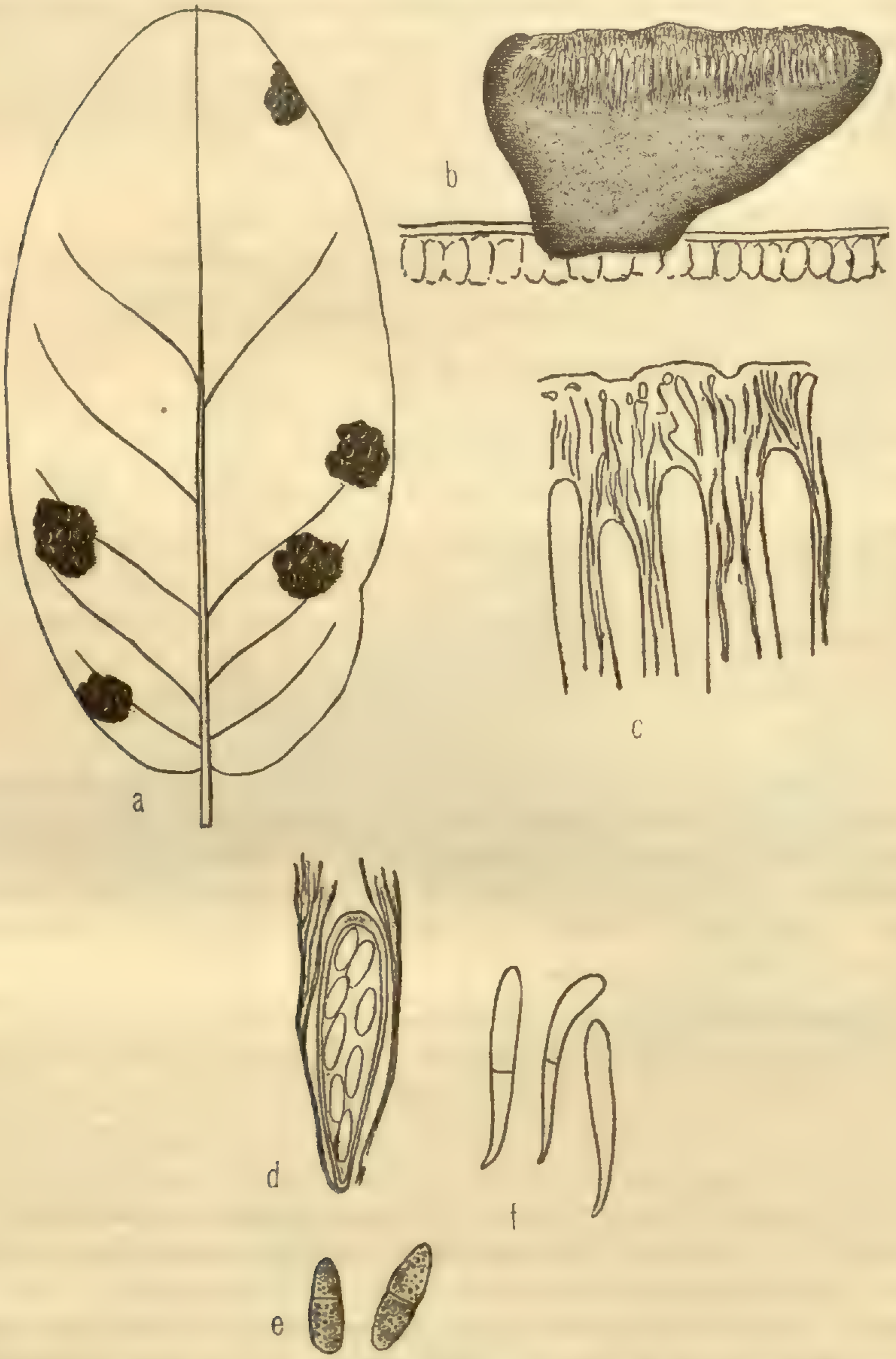

FIG. 4. *Bulgariastrum caespitosum* Syd. *a*, A Capparis leaf with some groups of ascomata (×2); *b*, longitudinal section through an ascoma (×60); *c*, epithecium (×380); *d*, ascus with paraphyses (×380); *e*, two sporidia (×600); *f*, three pycnidiospores (×600).

μ latis, superne late rotundatis, inferne sensim attenuatis, hyalinis.

LUZON, Manila and vicinity, *Merrill 8593*, February 22, 1913, on living leaves of *Capparis sepiaria*.

The fungus grows on living leaves where it forms small roundish colonies containing from 8 to 16 ascomata. The pycnidial stage is also present; it has the same habit as the ascigerons stage, and seems to belong to *Excipulina*. The pycnidiospores are usually continuous, then two-celled, and apparently very late indistinctly 3-4-celled.

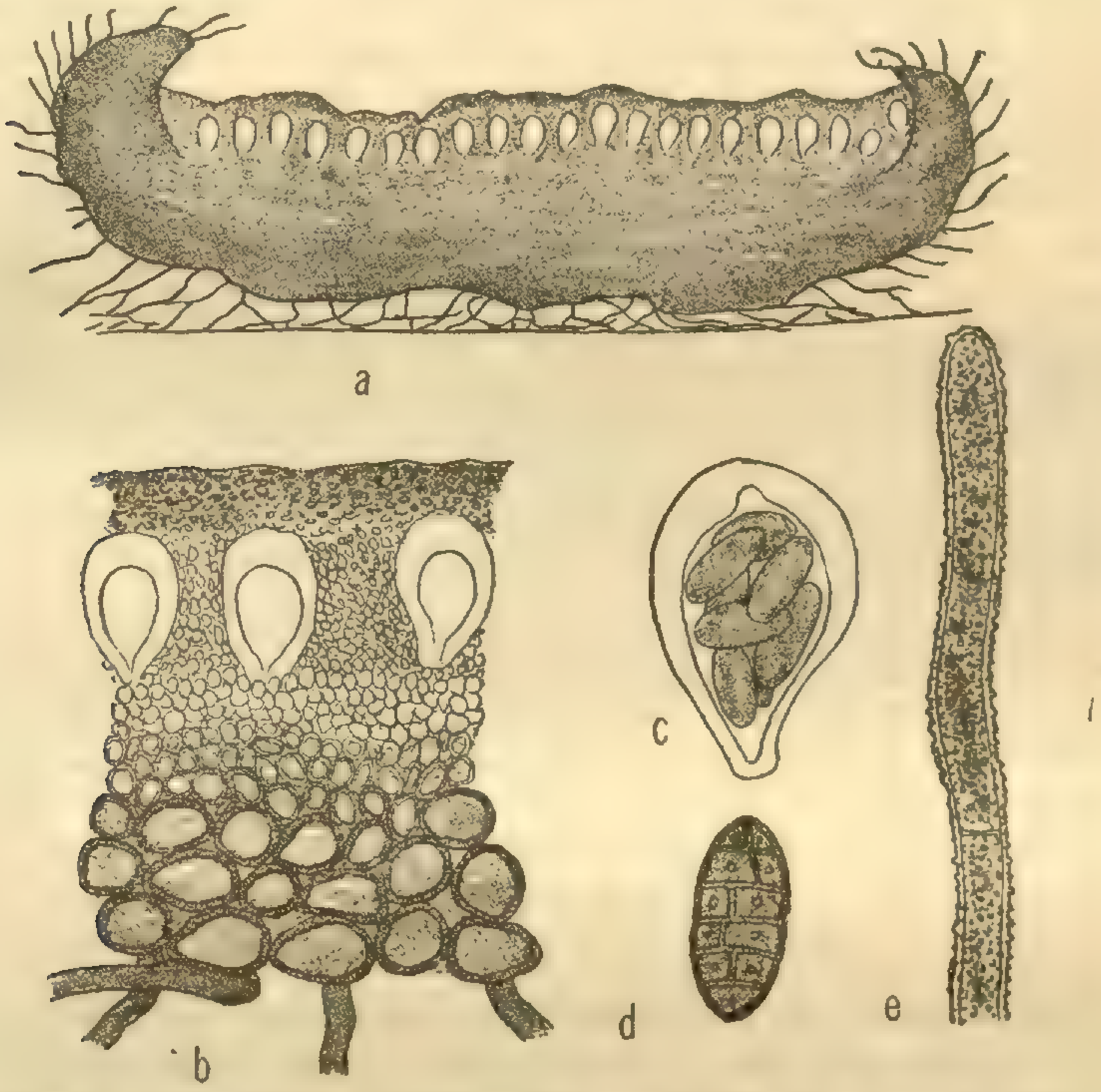

FIG. 5. *Calopeziza mirabilis* Syd. *a*, Longitudinal section through an ascoma (×60); *b*, fragment of a longitudinal section more highly magnified (×370); *c*, ascus (×600); *d*, sporidium (×650); *e*, seta (×600).

CALOPEZIZA Sydow gen. nov. Pseudopezizearum

(Etym. *calos*=pulcher et *Peziza*)

Ascomata sessilia, primitus globoso-clausa, dein patellaria, e mycelio tenui oriunda, orbicularia, superficialia, vivide colorata, ceracea, extus praecipue ad marginem pilosa, contextu parenchymatico. Asci ovato-globosi usque saccati, 6–8-spori, aparaphysati. Sporidia transverse pluriseptata, etiam longitudinaliter septata, colorata.

CALOPEZIZA MIRABILIS Syd. sp. nov. (Fig. 5).

Acomatibus hypophyllis, saepe per totam folii superficiem vel per magnam ejus partem plus minus aequaliter distributis, e mycelio tenuissimo ex hyphis longis flexuosis flavidulis simpli-

cibus vel raro parce breviterque ramosis parcissime septatis 4–6 μ latis composito oriundis, sessilibus, primo clausis, mox apertis et patellaribus, rotundatis, 0.3–1 mm diam., vivide luteo-ochraceis, ceraceis, extus praecipue ad marginem pilis rectis vel subrectis flavidis asperulis apice obtusis 80–150 μ longis 6–9 μ latis obsitis, disco concolore, contextu ad basim obscure fusco-olivaceo grosse parenchymatico ex cellulis 15–22 μ diam. composito, in centro et in parte superiore e cellulis multo minoribus composito; ascis remote stipatis, ovato-globosis, apice incrassatis et late rotundatis, brevissime crasseque stipitatis, 35–44 μ longis, 24–34 μ latis, 6–8-sporis, rarius elongatis subsaccatis et tunc usque 65 μ longis, aparaphysatis; sporidiis 2–4-stichis aut conglobatis, ellipsoideis vel ellipsoideo-oblongis, utrinque rotundatis, transverse 5-septatis (rarissime 6-septatis), ad septum medium constrictis, 22–26 μ longis, 11–12 μ latis, obscure olivaceo-fuscis, cellulis omnibus vel fere omnibus longitudinaliter 1-septatis.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20266 McGregor*, January, 1913: Province of Laguna, Los Baños, *Baker 1088*, May 1, 1913; both specimens on living leaves of *Premna odorata*.

A most beautiful fungus which cannot be compared with any known genus. The asci are rather remotely imbedded in a hyaline tissue formed of small parenchymatous cells. The whole hymenium is covered by a yellow-brown grumose or granular layer. Toward the bases of the ascomata the cells become very large, dark, and thick walled. These cells measure up to 22 μ in length, and are loosely united with each other.

DASYSCYPHA Fries

DASYSCYPHA MERRILLII Syd. sp. nov.

Ascomatibus sparsis, solitariis, cupulatis, breviter stipitatis flavo-citrinis, 300–500 μ latis, extus furfuraceo-pilosis; pilis brevibus, hyalino-flavidis, asperulis, 3–4.5 μ crassis; stipite albo-flavido, 200–250 μ longo; disco citrinulo; ascis tereti-clavulatis, 50–70 μ longis, 4–6 μ latis, octosporis; paraphysibus simplicibus, filiformibus, 1 μ crassis; sporidiis di- tristichis, acicularibus vel angustissime fusoideis, rectis, hyalinis, continuis, 13–16 μ longis, 1.5 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8658*, March, 1913, on dead stipes of *Cyathea* spec.

The species is related to *Dasyscypha Oncospermatis* (B. et Br.) Sacc., especially in external appearance. It differs, however, by having much smaller asci and sporidia.

ERINELLA Saccardo

ERINELLA PHILIPPINENSIS Syd. sp. nov.

Ascomatibus sparsis vel subgregariis, sessilibus vel brevissime crasseque stipitatis, cupuliformibus, 1–1.5 mm diam., margine integro, extus albido-ochraceis et pilis simplicibus rugulosis hya-

linis vel subhyalinis 35–50 μ longis 3–4 μ latis furfuracee conspersis, disco plano vel concavo levi, aureo-citrinulo; ascis cylindraceo-clavatis, 65–70 μ longis, 6–8 μ latis, octosporis, paraphysibus ascos superantibus, 2–2.5 μ latis, linearibus, apice vix attenuatis; sporidiis distichis, aciculari-fusoideis, 3-septatis, utrinque acutis, hyalinis, 20–28 μ longis, 2–2.5 μ latis.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20250 McGregor*, January, 1913, on dead bark.

Related to *Erinella cognata* Pat., but differing in the color of the ascomata and in the smaller sporidia.

PHYLLOSTICTA Persoon

PHYLLOSTICTA MANIHOTICOLA Syd. sp. nov.

Maculis amphigenis, magnis, irregularibus, 1–3 cm longis, ochraceis vel ochraceo-brunneis; pycnidiis praecipue hypophyllis, laxe aggregatis, immersis, vertice prominulis, globosos-conicis, atris apice pertusis, contextu obscure brunneo parenchymatico ex cellulis majusculis 8–11 μ diam. composito; sporulis variabilibus, subglobosis, ovatis vel oblongis, continuis, hyalinis, grosse 1-guttatis, 9–13 μ longis, 6–9 μ latis.

LUZON, Province of Laguna, Los Baños, *Baker 321*, October 14, 1912, on living leaves of *Manihot heptaphylla*.

PHYLLOSTICTA COCOPHILA Pass.

LUZON, Manila and vicinity, *Bur. Sci. 20644 Graff*, January, 1913, on leaves of *Cocos nucifera*.

PHYLLOSTICTA GRAFFIANA Sacc.

LUZON, vicinity of Manila, *Graff S 92*, December 2, 1912, on leaves of *Dioscorea fasciculata*.

MACROPHOMA Berlese et Voglino

MACROPHOMA MUSAE (Cke.) Berl. et Vogl.

LUZON, Province of Laguna, Los Baños, *Baker 973, 1031*, on dead leaves of *Musa sapientum:* Manila and vicinity, *Graff S 166*, March 26, 1913, on dead leaves of *Musa paradisiaca*.

PHOMOPSIS Saccardo

PHOMOPSIS BAKERI Syd. sp. nov.

Pycnidiis aequaliter densiusculeque dispersis, subcutaneis, depresso-globosis, atris, 160–200 μ diam., papilla minuta prominulis; sporulis aliis fusiformibus, utrinque acutis, continuis, hyalinis, 2–4-guttulatis, 9–14 μ longis, 3-3.5 μ latis; aliis apice hamatis, tandem saepe valde curvatis, continuis, hyalinis, 18–24 μ longis, 1 μ latis; basidiis 10–16 μ longis.

LUZON, Province of Laguna, Los Baños, *Baker 1241*, June 15, 1913, on dead twigs of *Ficus nota*.

PHOMOPSIS GLIRICIDIAE Syd. sp. nov.

Pycnidiis gregariis, ramos totos aequaliter obtegentibus, depresso-globosis, 120–180 μ diam., atris; sporulis aliis fusoideis, utrinque acutis, continuis, 4-guttulatis, hyalinis, 10–16 μ longis, 3 μ latis; aliis primo ad apicem hamatis, tandem valde curvatis et saepe falcatis, continuis, hyalinis, 17–22 μ longis, 1 μ latis; basidiis 8–12 μ longis.

LUZON, Province of Laguna, Los Baños, *Baker 1244*, June 15, 1913, on dead limbs of *Gliricidia sepium*.

SIROSPHAERA Sydow gen. nov. Sphaeropsidearum

(Etym. *seria*=catena et *sphaera* pro pycnidio)

Pycnidia in stromate superficiali ex hyphis obscure fuscis laxiuscule composito botryose aggregata, globoso-conoidea, atra, subcarbonacea, parenchymatice contexta, minute ostiolata. Basidia filiformia, simplicia, hyalina. Sporulae catenulatae, minutissimae, continuae dilutissime brunneolae.

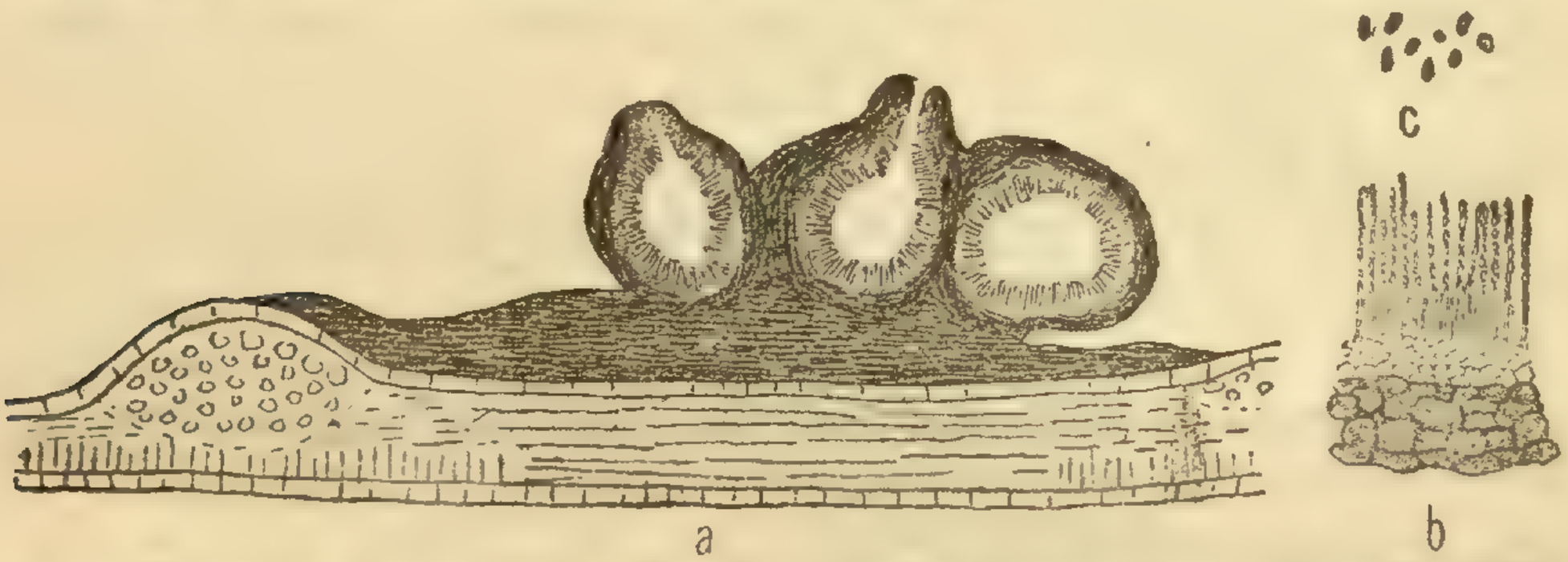

FIG. 6. *Sirosphaera botryosa* Syd. *a*, Longitudinal section through a group of pycnidia (×60); *b*, wall of the perithecium with basidia and chains of pycnidiospores (×870); *c*, pycnidiospores (×625).

SIROSPHAERA BOTRYOSA Syd. sp. nov. (Fig. 6).

Pycnidiis hypophyllis, in stromate omnino superficiali atro ex hyphis obscure fuscis laxiuscule composito dense botryose aggregatis et circulos rotundatos 0.5–1.3 mm latos formantibus, in stromate subperficialibus vel basi tantum leniter immersis, globoso-conoideis vel e mutua pressione leniter angulatis aut irregularibus, minutis, 100–150 μ diam., atris, subcarbonaceis, ostiolo distincto saepe papilliformiter producto praeditis, contextu parietis exterioris crassiusculi pluristratosis distincte parenchymatico fusco ex cellulis 8–10 μ diam. composito, parietis interioris hyalino indistincte minuteque celluloso, tota cavitate (ostiolo excepto) basidiis densissime stipatis vestita; basidiis filiformibus, simplicibus, hyalinis, 8–11 μ longis, 0.8–1 μ latis; sporulis distincte catenulatis, ovatis vel ellipsoideis, continuis, utrinque minutissime 1-guttulatis, 2–2.5 μ longis, 1.5 μ latis, dilutissime fuscidulis.

LUZON, Manila and vicinity, *Merrill 8600*, on living leaves of *Streblus asper*.

The fungus forms a quite superficial small stroma which is composed of dark-brown, rather loosely interwoven hyphae. The numerous pycnidia are nearly superficial or only with their bases slightly sunken in the stroma. The wall of the pycnidia is easily distinguished from the tissue of the stroma. The wall consists of two strata; an outer parenchymatous one, several layers thick, of brown color, and an inner one which is hyaline and composed of indistinct and minute cells. The whole cavity is filled with the basidia which bear numerous minute spores in chains.

SEPTORIA Fries

SEPTORIA BAKERI Syd.

LUZON, Manila and vicinity, *Merrill 8588*, February 24, 1913, on leaves of *Leucas lavandulifolia*.

LEPTOTHYRIUM Kunze et Schmidt

LEPTOTHYRIUM CIRCUMSCISSUM Syd. sp. nov.

Maculis amphigenis, sparsis vel aggregatis confluentibusque, angulatis, 1–4 mm diam., confluendo majoribus, primitus obscure brunneis, dein arescentibus, denique circumscissis; pycnidiis epiphyllis, immersis, rotundatis, dimidiatis, 100–150 μ diam., atris, poro rotundo 15–20 μ lato pertusis, contextu fusco, parenchymatico, ex cellulis minutis 5–6 μ diam. composito, haud radiato; sporulis continuis, hyalinis, breviter fusiformibus, utrinque acutis, 8–10 μ longis, 1.5–2 μ latis; basidiis non visis.

LUZON, Province of Laguna, Los Baños, *Baker 1025*, April 20, 1913, on living leaves of *Mangifera indica*.

PYCNOTHYRIUM Diedicke

PYCNOTHYRIUM LOBATUM Syd. sp. nov.

Pycnidiis epiphyllis, superficialibus, sparsis, ambitu orbicularibus, 0.5–1 mm diam., planis, membranaceis, atris, poro 25–40 μ lato pertusis, amoene radiatim contextis, ad marginem eximie lobatis, contextu dilute brunneo vel olivaceo-brunneo ex hyphis subrectis vel saepius flexuosis crebre septatis (articulis 7–9 μ longis) 2–4 μ crassis strato simplici composito; sporulis oblongis, utrinque obtusis, continuis, hyalinis, saepe minute guttulatis, 5–8 μ longis, 2 μ latis; basidiis nullis.

LUZON, Province of Laguna, San Antonio, *Bur. Sci. 20537 Ramos*, February, 1913, on living leaves of *Dysoxylum* spec.

The pycnidia are lobate at the margin in such a curious manner that holes are formed between the lobes.

LASIOTHYRIUM Sydow nov. gen. Pycnothyriacearum

(Etym. *lasios*=setosus et *thyrion*=fenestra)

Pycnidia superficialia, mycelio tenuissimo parce evoluto praedita, inversa, dimidiato-scutata, ambitu strato singulo hypharum flexuosarum vel cellularum elongatarum composita, centro ele-

vata opaca et plusristratosa, strato centrali exteriore tendem abjecto, contextu inferiore parenchymatico hyalino, e centro ad marginem versus pilis vel setis radiantibus flexuosis simplicibus obsita. Sporulae oblongae vel vermiformes, pluriseptatae, coloratae.

LASIOTHYRIUM CYCLOSCHIZON Syd. spec. nov. (Fig. 7).

Pycnidis epiphyllis, in greges rotundatos 3–10 mm diam. densiuscule dispositis, mycelio tenuissimo parco ex hyphis longius-

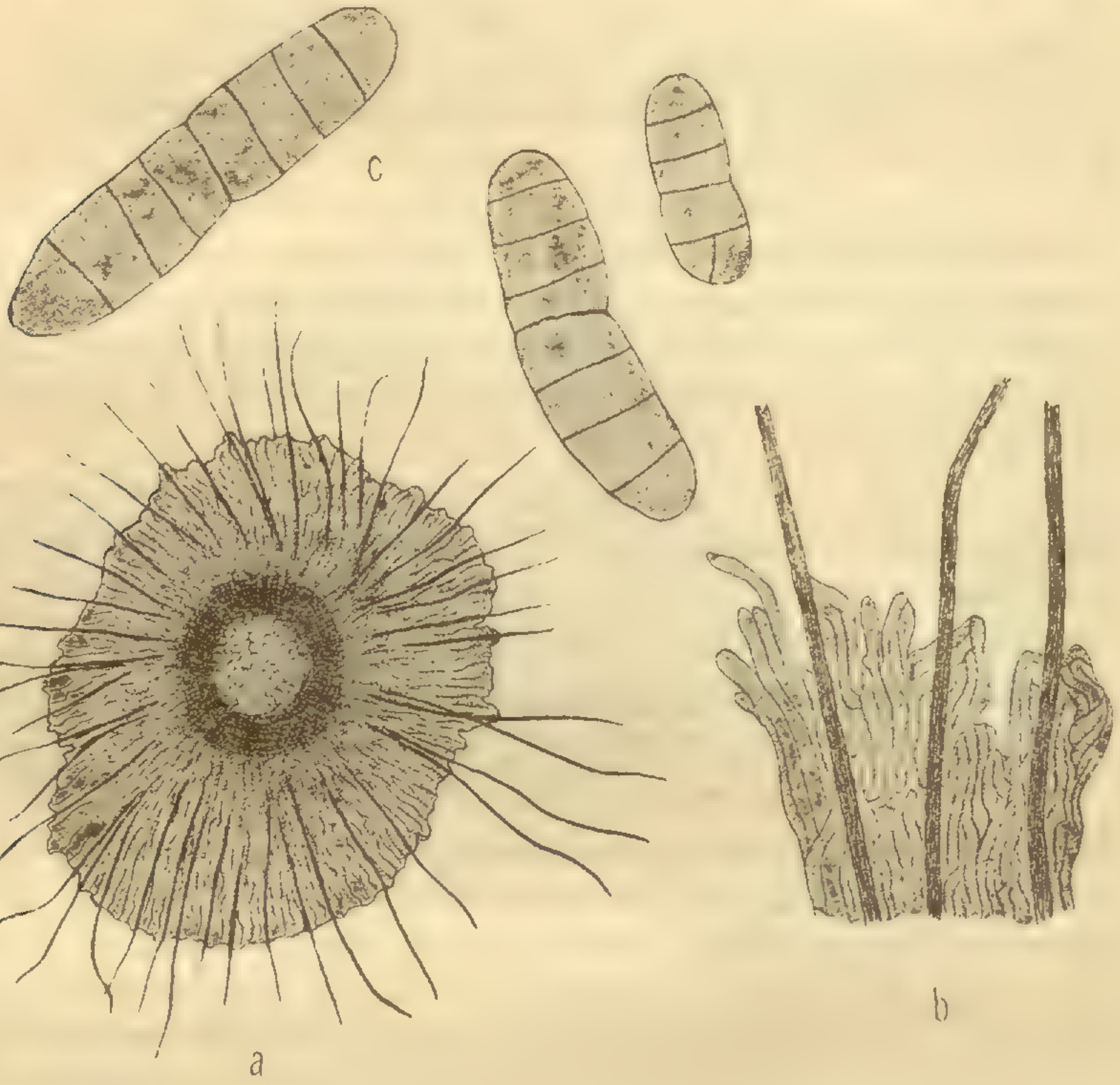

FIG. 7. *Lasiothyrium cycloschizon* Syd. *a*, A pycnidium seen from above (×100); *b*, fragment of the marginal part of the pycnidium (×600); *c*, pycnidiospores (×1300).

culis non vel parce ramosis et non vel vix septatis fuscis 3.5–5 μ crassis composito, inversis, dimidato-scutatis, superficialibus, rotundatis, rarius leniter elongatis, 150–350 μ diam., contextu ad marginem strato singulo hypharum flexuosarum 1.5–2 μ latarum vel potius cellularum elongatarum maeandrice curvatarum olivaceo-fuscidularum composito, centro elevatis pluristratosis et opacis, contextu partis centralis interiore parenchymatico hyalino vel subhyalino ex cellulis 4–6 μ diam. composito, mox circa partem centralem fissura circulari dehiscentibus et partem centralem

exteriorem abjicientibus, e centro ad marginem pilis radiantibus numerosis longis flexuosis simplicibus continuis flavo-brunneis, 3–4 μ crassis obsitis; sporulis oblongis vel vermiformibus, utrinque obtusis, 3–8-septatis, ad septum centrale saepe constrictis, levibus, fuscis, 16–28 μ longis, 6–8 μ latis, subinde sed raro cellula una alterave septo unico longitudinali vel obliquo divisa; basidiis non visis.

LUZON, Manila and vicinity, *Merrill S 152*, February 22, 1913, on living or languishing leaves of *Aegiceras corniculatum*.

The pycnidia are formed of two parts very different in their composition, a peripheral one, being only a single nearly pellucid layer of thin flexuose hyphae or rather of elongated and curved cells, and a central one which is elevated, dark, and pluristratose. Finally, the outer central layer is thrown off, and the inner tissue composed of hyaline or subhyaline, small, parenchymatous cells is to be seen. The pycnidia open by a circular fissure around the elevated central part, later more longitudinal fissures extending up to the margin are to be seen. From nearly the center numerous long bristles or setae, lying upon the pycnidia, radiate toward the margin. The spores are pluriseptate and brownish. The material at hand is somewhat old, hence we were not able to state whether the spores are borne on basidia or not. Sometimes, but very rarely, one or the other cell of the spores may be divided by a longitudinal or oblique septum.

GLOEOSPORIUM Desmazières et Montagne

GLOEOSPORIUM PALMARUM Oudem.

LUZON, Manila and vicinity, *Merrill 8587*, February 22, 1913, on leaf-sheaths of *Areca catechu*.

GLOEOSPORIUM LEBBECK Syd. sp. nov.

Acervulis sparsis vel aggregatis, sine maculis, subcutaneis, rotundatis, 90–125 μ diam., brunneis, conidiis oblongis vel late cylindraceis, utrinque late rotundatis, continuis, hyalinis, minute guttulatis, 12–18 μ longis, 3.5–4.5 μ latis; basidiis subnullis.

LUZON, Province of Bataan, Lamao, *Merrill S 149*, February 3, 1913, on legumes of *Albizzia lebbeck*.

CYLINDROSPORIUM Unger

CYLINDROSPORIUM EXIGUUM Syd. sp. nov.

Maculis majusculis, pallide ochraceis, 0.5–1.5 cm diam.; acervulis hypophyllis, gregariis, erumpenti-superficialibus, exiguis, dilute ochraceis; conidiis anguste cylindraceis, tectis vel curvatis, utrinque obtusis, 4–6-septatis, non constrictis, hyalinis, 45–70 μ longis, 3.5–4.5 μ latis.

LUZON, Manila and vicinity, *Merrill 8603*, February 10, 1913, on languishing leaves of *Calonyction aculeatum*.

MELANCONIUM Link

MELANCONIUM MERRILLII Syd. sp. nov.

Acervulis amphigenis, sparsis erumpentibus, minutis, 100–150 μ diam., planis, atris; conidiis crasse fusoideis, vel angustissime ellipsoideis, plerumque utrinque attenuatis, continuis, eguttulatis, intense olivaceis, 10–13 μ longis, 3.5–4.5 μ latis.

LUZON, Manila and vicinity, *Merrill 8471, 8540*, November and December, 1912, January, 1913, on dead leaves of *Pandanus tectorius*.

PESTALOZZIA de Notaris

PESTALOZZIA PALMARUM Cke.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8646*, March, 1913, on leaves of *Pinanga* spec.

OIDIUM Link

OIDIUM ERYSIPHOIDES Fr.

LUZON, Manila and vicinity, *Merrill 8548*, January, 1913, on leaves of *Desmodium procumbens; Bur. Sci. 20653 Graff*, March 13, 1913, on leaves of *Heliotropium indicum*.

OOSPORA Wallroth

OOSPORA OBDUCENS Syd. sp. nov.

Caespitulis effusis, crassiusculis, intense viridibus, confluentibus et totum insecti corpus plus minus obtegentibus; conidiis anguste ellipsoideis vel oblongis, utrinque obtusis, 2–4-guttulatis, continuis, hyalinis, 9–13 μ longis, 3.5–5 μ latis, rarius subglobosis vel late ellipsoideis et tunc 6–9 μ tantum longis.

LUZON, Province of Laguna, Mt. Maquiling near Los Baños, *W. H. Brown*, comm. *Baker 1030*, April 28, 1913, parasitic on living cicadas.

We have seen only one cicada beset with the fungus. Our specimen is already much advanced in development, hence we have seen no trace of mycelium. The conidia seem to be formed in chains, but they readily segregate. Younger stages of this interesting fungus will be necessary to determine if it is indeed an *Oospora* or not.

ASPERGILLUS Link

ASPERGILLUS PERICONIOIDES Sacc.

LUZON, Province of Bataan, Lamao, *Graff S 136*, November, 1912, on living leaves of *Carica Papaya*.

TRICHOSPORIUM Fries

TRICHOSPORIUM OLIVATRUM Sacc.

LUZON, Province of Rizal, Antipolo, *Bur. Sci. 16830 Ramos*, October, 1912, on dead *Bambusa* spec.

CATENULARIA Glove

CATENULARIA VELUTINA Syd. sp. nov.

Caespitulis amphigenis, sparsis, superficialibus, rotundatis, 1–3 mm diam., crassis, velutinis, atris; hyphis fertilibus dense stipatis, erectis, simplicibus, saepe leniter flexuosis, septatis (articulis 12–20 μ longis), fuscis 3–3.5 μ crassis, usque 100 μ longis; catenulis conidiorum simplicibus, longiusculis, sed facillime secedentibus; conidiis subglobosis, ellipsoideis vel oblongis, continuis, fuscis, levibus, 5–10 μ longis, 3.5–4.5 μ latis.

LUZON, Province of Laguna, Mt. Maquiling, *Merrill 8608*, March, 1913, on languishing and dying leaves of *Freycinetia* spec.

FUSICLADIUM Bonorden

FUSICLADIUM PONGAMIAE Syd.

LUZON, Province of Bataan, Lamao, *Merrill 8682*, January, 1913, on leaves of *Pongamia mitis* (*P. glabra*).

CLADOSPORIUM Link

CLADOSPORIUM OPLISMENI Syd. sp. nov.

Caespitulis crassis, fructus totos densissime obtegentibus et eos omnino destruentibus, olivaceo-brunneis; hyphis simplicibus, remote septatis, olivaceo-brunneis usque 90 μ longis, 3–5 μ crassis; conidiis olivaceo-brunneis, continuis et 6–10 μ longis 3.5–4.5 μ latis vel elongatis 1–3-septatis et tunc usque 20 μ longis, levibus.

LUZON, Subprovince of Ifugao, Mt. Polis, *Bur. Sci. 19897 McGregor*, February, 1913, on spikes of *Opolismenus undulatifolius*.

CERCOSPORA Fresenius

CERCOSPORA TABERNAEMONTANAE Syd. sp. nov.

Maculis amphigenis, orbicularibus, 0.5–1 cm diam., pallide flavis, dein centro arescentibus, obscurius marginatis; caespitulis amphigenis, in hypophyllo copiosius evolutis, densiuscule distributis, minutissimis, 30–50 μ diam., atris; hyphis fasciculatis, brevibus, 10–20 μ longis, 2.5–3 μ latis, simplicibus, continuis, hyalino-olivaceis; conidiis elongato-clavatis, 3–6-septatis, hyalinis, 40–60 μ longis, 3–3.5 μ latis.

LUZON, Province of Laguna, Los Baños, *Baker 1027*, April 20, 1913, on leaves of *Tabernaemontana pandacaqui*.

CERCOSPORA MANGIFERAE Koorders

Maculis amphigenis, in hypophyllo magis visibilibus, sparsis, rotundatis, 1–3 mm diam., subatris, 30–50 μ diam., firmis; hyphis brevissimis, continuis, simplicibus, apice obtusis, dilute fuscidu-

lis, 6–12 μ longis, 3.5–4 μ latis; conidiis solitarie acrogenis, longe angusteque obclavatis, sed apice obtusis, 3–6-septatis, non constrictis, 40–60 μ longis, 4 μ latis, fuscidulis, loculis praecipue inferioribus guttulatis.

LUZON, Province of Laguna, Los Baños, *Baker 1122,* April 21, 1913, on leaves of *Mangifera indica.*

The above description has been made from the Philippine material. It may be mentioned in this place that the host of *Cercospora subtorulosa* Syd., also collected by Baker at Los Baños and described in Annal. Mycol. 11 (1913) 270, is not *Allophylus,* but, as the collector informs us, *Melicope triphylla.*

CERCOSPORA GLIRICIDIAE Syd.

LUZON, Province of Cavite, Cavite, *Bur. Sci. 19128 Graff,* November 24, 1912: Province of Batangas, Santo Tomas, *Bur. Sci. 19127 Graff,* November 30, 1912: Province of Laguna, Pagsanjan, *Graff S 161,* February 22, 1913: Vicinity of Manila, *Merrill S 145,* January 26, 1913, all specimens on leaves of *Gliricidia sepium.*

CERCOSPORA LITSEAE-GLUTINOSAE Syd.

LUZON, Manila and vicinity, *Merrill 8480,* December, 1912: Province of Bataan, *Bur. Sci. 19042, 19073 Graff,* November, 1912, on leaves of *Litsea glutinosa.*

CERCOSPORA NICOTIANAE Ell. et Ev.

LUZON, Province of Laguna, Los Baños, *Baker 870, 881,* March, 1913, on leaves of *Nicotiana Tabacum.*

HETEROSPORIUM Klotzsch

HETEROSPORIUM CORYPHAE Syd.

LUZON, Manila and vicinity, *Merrill 8541,* January, 1913, on leaves of *Corypha elata.*

STIGMELLA Léveillé

STIGMELLA MANILENSIS Sacc.

LUZON, Manila and vicinity, *Merrill S 123,* November, 1912, on pods of *Cassia Tora.*

HYMENOPSIS Saccardo

HYMENOPSIS CUDRANIAE Mass.

LUZON, Province of Nueva Vizcaya, *Bur. Sci. 20267 McGregor,* January, 1913, on leaves of *Cudrania javanica.*

[Vol. VIII, No. 5, including pages 287 to 406, was issued Nov. 19, 1913.]

ERRATA

Page 196, line 10 from top, for *Derris* sp. (aff. *D. ellipticae* Benth.), read *Aglaonema densinervium* Engl.
268, line 7 from bottom, for 2 ad 9 read 7 ad 9.
line 2 from bottom, for diformibus, read biformibus.
269, line 10 from bottom, for 1 ad 3, read 0.33 ad 1.
270, line 18 from top, for 1.25 read 0.25.
356, line 21 from top, for Atronia, read Astronia.
397, line 18 from top, for Neisse read Neissl.

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(New genera and combinations published for the first time are in **black-faced type**; synonyms and species mentioned incidentally in the text are indicated by the page references being in *italics*.)

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